Animal Husbandry in Hungary in the 19th-20th centuries

by L. Gaál and P. Gunst

Akadémiai Kiadó, Budapest

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The history of animal husbandry in Hungary in the interwar period with special reference to the socio-economic features following the disintegration of the Monarchy as well as the economic crisis are presented here in the light of relevant statistical trends.

The topics based on the phenomena of Hungarian economic history deal with the development of animal husbandry in the decades before the First World War elaborated by appropriate source criticism and statistical data and literature of the period concerned.

Above all, this volume gives some insight into the development of animal husbandry in an East-Central European country under capitalism and under the initial phases of socialism.

The numerous source criticisms, statistical tables and the contemporary literature make this book worth-while not only to readers of history, especially economic history, of ethnology, agricultural economics, agricultural sciences but also to those in the fields of sociology, planning and animal hygiene.

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by L. Gaál and P. Gunst

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Preface

Our work is the first attempt to write about the history of one branch of agricultural production – livestock husbandry – in Hungary in the first half of the 20th century. The need for such an analysis arose long ago. It has been urged by historians in their effort to elucidate, understand and explain the economic, social and political changes of the inter-war period for which this analysis on various fields of life could provide a reliable basis. Moreover the actual agricultural policy has called for it as well, since it is orientating itself along historical perspectives.

Of special importance from this point of view is the period of roughly two decades between 1920 and 1938, since the historical investigations here can take such economic and other factors into consideration of which the effect is actually felt even today. After the First World War the disintegration of the Austro-Hungarian Monarchy and the development of the new territory of Hungary meant a change of fundamental importance influencing development – not only that of livestock breeding – from many sides. Important changes occurred in the possibilities, tendencies and rates of development in livestock breeding too, and without an examination of these the results of agrarian policy followed after 1945 cannot be understood.

For a comprehension of these processes in any perspective it has been indispensable to acquaint the readers with the development taking place in animal husbandry during the decades between the abolition of serfdom in 1848 and the First World War. So many legends have circulated – and not only in Hungary – about the history of Hungarian livestock breeding that a true presentation of the facts is indispensable. Changes involved by the new frontiers established after the First World War are also dealt with in detail. The standard of animal husbandry on the present area of Hungary before the First World War had to be established, for it was the basis of development between the two World Wars. And in this context particulars had to be given about the structural differences in animal husbandry between the present territory and the areas disannexed from Hungary even before 1914, and which with the new borders set up after the First World War had to establish an independent life. Even the Hungarian expert often draws a parallel with the conditions prevailing before the First World War and compares the present situation to them, without considering the fact that due to the territorial changes such comparisons are unrealistic as they do not refer to the same areas.

We endeavoured to interpret the questions of animal husbandry in a broad sense relying on its relations to other branches of agriculture. Therefore references to the history of agricultural production as a whole, or to that of contemporary

Hungarian economy were indispensable in this work. Moreover we tried to make the readers, unfamiliar with the Hungarian conditions, understand the features concealed in the development of Hungarian agriculture. Thus the whole contemporary agriculture of Hungary is reflected.

Though not aiming at completeness, our main objective was to study the factors that had or may have had an influence on production. That is why the role of production policy – among others – was taken into consideration, which often primarily determined the conditions of production, especially from the period of the economic world crisis. On the other hand, we took the farm conditions into account only inasmuch as they influenced the historical development of the individual branches of livestock farming.

Part I

Chapter 1 Development of agriculture in Hungary from 1848 to the First World War

The literature on European economic history from the 15th–16th centuries usually mentions Hungary as one of the main meat suppliers of an enormous cattle reserve of Central and Western Europe. The more than a hundred thousand cattle regularly driven out of Hungary every year supplied the markets of Venice, Vienna, of the South and Central German towns, and sometimes even of more distant West-European towns over centuries. As generally known today, Hungary was only a part of the semicircular zone stretching from Southern Scandinavia through the German seaside and Polish steppes down to Moldavia which produced an ever increasing amount of meat required for the developing Western and Central European towns.

On the other hand, 19th century Hungary, was described in works on economic history as one of the vast granaries of Europe. From the middle of the 19th century, Hungary was for years one of the largest grain exporters of Europe; and only if we consider that the European grain markets received from Hungary the amount left behind by the western part of the Hapsburg Empire, Austria and Bohemia, that is less than half of the grain surplus produced in Hungary, can we wholly assess the great change that took place in the production structure of Hungarian agriculture at that time.

The fact, that in the middle of the 19th century it was no longer the Hungarian meat but the Hungarian cereals that played the more important role on the markets of Europe, was not only due to developments in agriculture in Hungary. The western part of the Hapsburg Empire purchased an increasing amount of meat and so animals were exported from Hungary beyond the customs frontiers of the Empire in a reduced amount. But, of course, these are not the only reasons.

The traditional structure of Hungarian agriculture characterized by cereal production based on the shift of crop, and by nomadic or semi-nomadic livestock rearing (first of all cattle raising, then sheep and pig breeding), at the turn of the 18th century and later began to undergo a transformation. Up to that time cereal production had been controlled by the limited possibilities of transportation. Land transport over greater distances was not profitable, and water transport on a larger scale along the Danube toward Vienna only started in the second half of the 18th century. It was the realization of this transport possibility as well as a demand raised in Lower Austria (Graz) that caused the extension of cereal production in the West-Transdanubian estates in the second half of the 18th century. Where this transport possibility was not available the extension of cereal production was determined by the capacity of the local market. The peasantry grew crops prima-

rily for self-consumption; town markets only played a role in small districts. Considering, however, that the majority of Hungarian towns had not yet broken away from agriculture at that time, and a considerable part of their population grew crops and kept animals themselves, the town markets grew but very slowly and were restricted to some industrialized towns in Hungary. Only one larger consumer presented itself until the end of the 18th century, the army, which created a constant and regular demand for agricultural produce. The grain surplus beyond satisfying the demand of the army rotted in storehouses. This applies in the first place to large estates which produced grain crops by utilizing serf labour but – excluding the manors in the western part of the country – having small markets, were often compelled to store their produces for years. Manorial farming based on serf labour was thus limited by the lack of transport facilities in Hungary unlike e.g. Poland or Germany where the rivers (e.g. Vistula) flowing into the sea ensured relatively early an excellent water-way for the export of cereals and timber.

Hence, up to the end of the 18th century animals rather than cereals were the most important agricultural commodities of Hungary. Namely, cattle could be driven to such markets where grains could not be transported. That is why the grey Hungarian cattle raised on the excellent Hungarian (mainly lowland) pastures and covering considerable distances without any difficulties predominated over centuries in the exports of the country. Cattle rearing was the leading branch of agriculture; pigs and sheep were raised by the serfs mainly for own consumption (food, clothes), and horses for carting. There was, naturally, another form of utilizing cattle: as a draught animal, where it played an important role. The management of large estates was on the whole characterized by similar conditions.

All this began to change in the second half of the 18th century, and mainly at the turn of the 18th century, following the Napoleonic wars. The first wave of an increased European interest in wool reached Hungary in the seventies and eighties of the 18th century. As a result of the economic policy of Maria Theresa's enlightened despotism, improved sheep breeds, first of all of Spanish origin, were introduced in Hungary, and following a rise in the price of wool, sheep breeding gradually came into prominence on the large estates too. This was backed by a temporary upswing during the war at the turn of the century which, however, affected cereal production as well. The rise in number of the army, the accumulation of reserves, etc. caused a boom in grain production which was felt all over the country, in accordance with the structure of agriculture first of all – naturally – in the seignioral farms, since the production cost of grain crops grown on the tax-free seignioral lands by serf labour, i.e. with unpaid labour and draught power, and delivered to the market by means of serfs was minimal, and the cash requirements hardly worth mentioning. The price advance of commodity grain crops only raised the seignioral income, while the structure of peasant production remained unchanged.

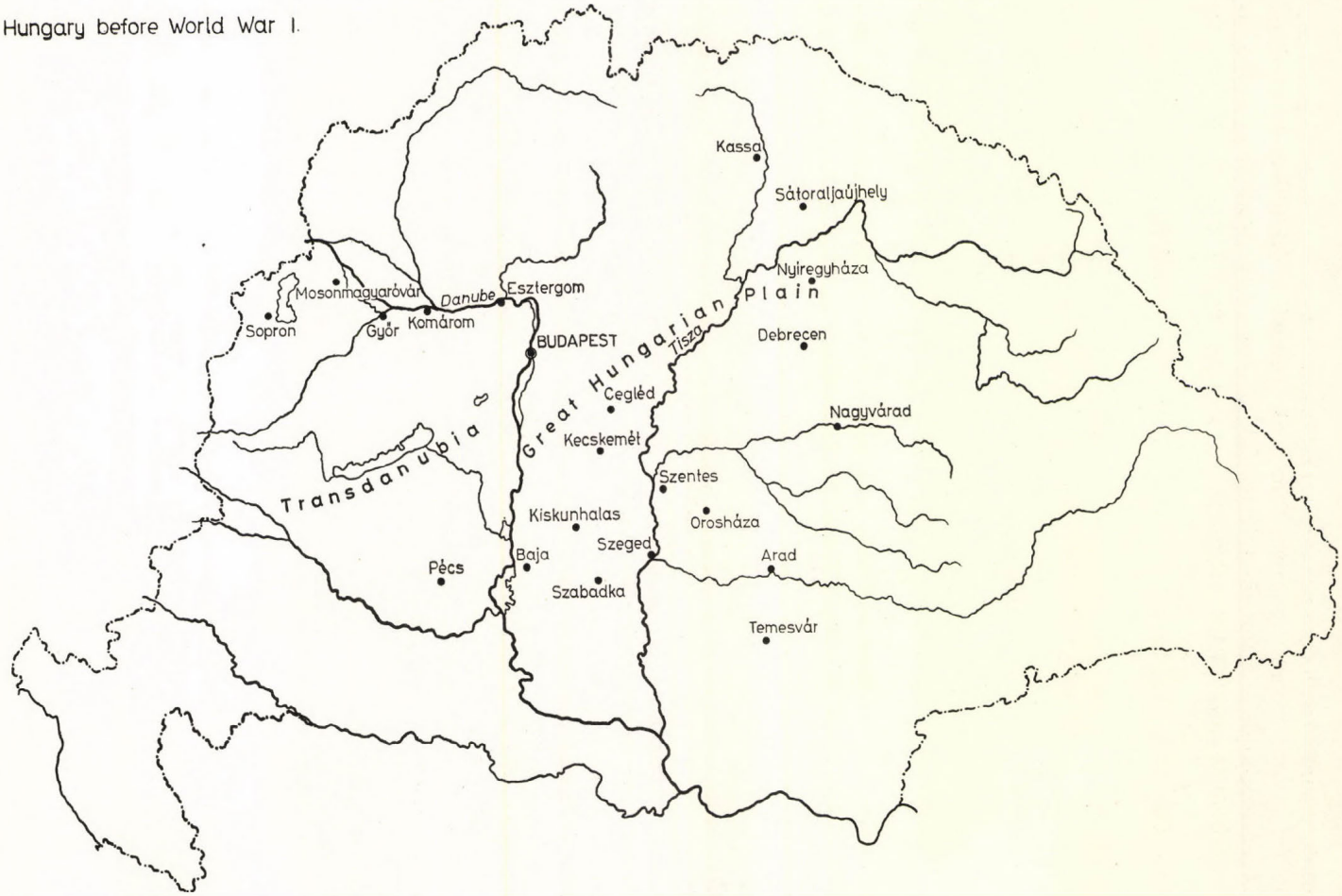
The increased interest in grains during the Napoleonic wars accelerated the process of growth of arable areas which began in the second half of the 18th

century parallel with drainage works. Fertile meadows were ploughed up and converted to arable ones. Hence the frames of livestock breeding based on grazing began to shrink, and this foretold the future crisis of the traditional method of animal husbandry at the beginning of the 18th century already. Namely, the amount of fodder crops produced to replace the yield of lost pastures was very low. Therefore, the livestock – primarily that of serfs – was hard hit by the boom in grain production.

The first phase of the crisis was a structural transformation in the livestock. From the beginning of the 18th century sheep breeding became the leading branch of livestock farming. From the gradually shrinking grazing lands the cattle was pushed out by the extraordinarily growing stock of sheep. The landlords were the first to sell their herds (and sometimes even their studs) in order to be able to increase the number of their flocks(1). This made its effect felt as early as in the first years of the 19th century in the higher price of beef, and in towns in the shortage of beef(2). The process was completed in the 1820s. Several years after the Napoleonic wars a great drop in grain prices began. Between 1818 and 1824 grain prices fell by 70 per cent. This fall in income was compensated for by a great boom in wool in the twenties caused by the rapid post-war development of the Western European textile industry. Between 1820 and 1826 the price of fine wool rose by 70 per cent in Hungary(3). For several years, until the prosperity of the Central European wool business was arrested by an upswing in the overseas and Russian wool production, this situation rendered sheep breeding the leading branch of livestock farming in Hungary too. The owners of large estates quickly changed over to raising fine-wooled Merino sheep, and their animals occupied the common pastures(4). The effect was by and large the same as in England in the 15th–16th centuries which Thomas Moore described so illustratively.

It must be emphasized that the high profitability of both grain and wool production in the seignioral farms was possible primarily on account of the unpaid serf labour employed, thereby entailing extremely low production costs. They could not, however, do without certain investments since both the extension of cereal production and the promotion of sheep breeding – as it has already been mentioned – changed the traditional pattern of production. Ploughing up of meadows and pastures made the production of cultivated fodder crops necessary, at least to some extent, and the demand for fine wool called for the introduction of new sheep breeds, or at least the improvement of the traditional Hungarian ones (racka, cigája). It was at this point at the turn of the 18th early century that seignioral and serf-peasant farming separated from each other in the agriculture of Hungary. Like the other economically undeveloped countries, Hungary was characterized by the following: land was almost the only capital, that is, any capital sufficient for the modernization of production only accumulated in the possession of an owner with land of a certain size(5). While with the modification of production structure and the prosperity of wool there began a modernization of production, transformation of cropping system, introduction of improved breeds of sheep and of more developed western breeding and management methods

Hungary before World War I.



in the seignioral farms, peasant farming was not affected either by prosperity or by structural transformation(6). Serfs could not produce more grains, since they had to reserve their grazing areas for their animals, and the system of common pastures and the strict pattern of crop rotation excluded the possibility of change anyway. As for the prosperity of wool production only its drawbacks were felt since the demand for wool of the traditional breeds of sheep did not grow, and the structure of peasant sheep raising had not changed so far; in the farming of serfs sheep continued to serve the purposes of nutrition (milk, meat) and clothing. On the other hand, the fight for the pastures became more acute, the animals of the serfs were gradually pushed out(7). So up to the end of the 1840s – as long as wool production was a prosperous business – the position of other branches of livestock breeding continued to decline.

The cattle-plague of eastern origin had a considerable part in the decreased importance of cattle rearing during the whole period(8) especially between 1838 and 1842, then between 1848 and 1867. As a further cause the upswing in sheep breeding brought about the same result as in England in the 16th century: the continuous decrease of the cattle stock ousted from the pastures made importing necessary. The import and rapid improvement was followed by the marketing of Moldavian cattle in Hungary too. This import of animals increased, in turn, the damages done by the anyway spreading cattle-plague. Under influence of all these factors the structure of export naturally changed as well. In the first years of the 19th century as many as 150 thousand cattle were exported from Hungary a year. This number fell to about 90–100 thousand in the twenties and to 70 thousand in the thirties of the 19th century. The wool export, on the other hand, which at the beginning of the century amounted to some 60–65 thousand quintals was doubled in the thirties, and reached a peak of about 146 thousand quintals in 1846 (most of it was unwashed wool). The export of sheep increased as well, amounting to an annual number of about 217 thousand at the end of the twenties. The export of pigs grew from an average of 148 thousand in 1816–18 to 345 thousand by 1845. In 1845 the share of the major animal products in the total value of Hungarian exports was 46·1 per cent. The value of wool exports was 29 per cent, while that of cattle export only 5·8 and of the export of pigs 5 per cent of the total value of exports. The export of leather amounted to 1·9 per cent. No other animal product (sheep, horse, feather, suet, honey, wax, egg, meat, lard, milk, butter, cheese, etc.) even reached 1 per cent of the total value of exports, and all of them together only amounted to 6·3 per cent. This alone underlines the economic importance of sheep breeding(9).

But what was livestock rearing like in Hungary in the middle of the last century? We can safely say that it was in livestock husbandry of all sectors of agriculture that the difference between large-scale techniques adopting the up-to-date professional knowledge of the age and the backward traditional peasant practice was the most striking. The larger half of the livestock of Hungary was owned by the peasantry. This stock consisted exclusively of animals of traditional breed (grey Hungarian cattle, "racka" or "cigája" sheep, "bakonyi", "szalontai" or other

native pigs, Hungarian horses). These breeds fulfilled the requirements of the contemporary peasant farm inasmuch as the Hungarian cattle was an excellent draught animal, the "racka" and "cigája" sheep produced sufficient amounts of milk (and milk products), wool satisfying the demands of Hungarian peasants, fur and leather, and meat as well. The Hungarian horse was of small size, appearing scrubby compared to the contemporary European breeds, but a strong animal fit for the conditions of roads in Hungary, and well-proved in carting. Hungarian pig breeds were used to being fed almost exclusively on mast, occasionally on spoiled grains, pig-wash, etc. in the peasant farms, that is, modern feeding techniques were still unknown in pig breeding. The animals were raised in the open and only kept under lean-to roof overnight (and sometimes in winter). An overwhelming part of the peasant livestock (except the horses) lived thus exclusively on pastures. Hence the usually neglected animals raised in the open suffered disadvantages in every respect. They were insufficiently fed (stronger animals grazed at the expense of the weaker ones) and hardly cared for. Even the most elementary rules of mating were not observed, mating was controlled entirely by nature—of course at the expense of quality again. Pastures were not cared for either; neither their cultivation nor their utilization was satisfactory. As a consequence, yields were low. According to contemporary descriptions e.g. the annual milk production of grey Hungarian cows kept mostly in the open ranged between 425 and 570 litres(10). The animals were, in general, uncared-for, dairy farming e.g., which involved at least partial stabling, was only introduced in certain regions of the country. This totally extensive method of animal raising in peasant farms was in sharp contrast with the more intensive techniques used in developed seignioral large farms. The sheep stock of larger estates e.g. consisted exclusively of merino (electoral-negretti) flocks. Even if their management was still mostly extensive (feeding on pasture played a much more important role than, for example in England), these animals were already fed according to the standards of those times, on field-grown fodders. Their utilization was of course more one-sided than that of peasant sheep, since these animals were not milked and usually not maintained for their meat, but their wool yield was superior both in quality and quantity to the traditional Hungarian breeds. The maintenance of these breeds transformed also the pattern of crop growing in large farms since their feeding had to be provided for. The situation was the same with respect to other animal species too. In cattle farming e.g. western dairy-type cows were introduced in some large farms, especially in West-Transdanubia. The first import of western cows was recorded in 1680, but in the first half of the 19th century western type dairy plants generally began to spread in large-scale farms, which, naturally, involved, the introduction of up-to-date methods of management. Large-scale pig-rearing too underwent transformation. It was in the thirties and forties of the 19th century that the "mangalica", a breed of mostly southern origin, was introduced in large-scale farms and the traditional breeds were completely pushed out. This breed, inclined to fattening, of which the bacon and lard could be exported was, naturally, fed on field-grown fodders in large farms. There were changes in the seignioral

horse breeding too. Attempts were made to improve the Hungarian stock of horses by importing western (partly English) and Arabian horses. Even this attempt by the government in the interests of the army was felt in the first place in the horse-stocks of large-scale farms; the heavier cold-blooded horses too began to spread here(11).

Livestock husbandry in Hungary was thus characterized by a rapidly developing duality in the middle of the last century. It bore the marks of traditional, primitive peasant animal raising based mainly on nomadic pasturage on the one hand, and of the modern stabling methods applied in larger, more developed estates, corresponding to the level of the age, on the other. The latter had a great influence on the crop production of the farm, namely in such farms an interaction developed between livestock breeding and crop production.

The traditional system of agricultural production in Hungary was broken up in the middle of the 19th century by the abolition of serfdom. As a result of the revolution in 1848 serfs became emancipated in Hungary too. The abolition of serfdom left the allodial, seignioral lands – i.e. those not used by the serfs before1848 – in the landlords' possession, maintaining thereby for long decades the system of large estates, since nearly half of the territory of the country remained in the former landlords' hands, while the lands earlier used by the serfs (lands held in villeinage with the common pastures, forests, etc. belonging to them) were given – with a promise of compensation by the government – to the serfs as absolute property. This peculiarity of the abolition of serfdom was one of the factors determining agricultural development in Hungary for the subsequent decades.

The abolition of serfdom changed the former structure of agriculture completely. The landlords lost overnight the unpaid labour of the serfs, and in addition in most farms even the working tools of serfs which had been used free of charge. State compensation, on the other hand, protracted over decades, did not supply the cash required to continue farming (employ labour force, purchase working tools). True, the abolition of entailment made it possible to borrow money and obtain capital thereby, but the general deficiency of funds in the country, and the fact that the western part of the Hapsburg Empire was in a similar need of capital import made this available only for the richest aristocrats, the proprietors of the largest estates. The mortgage system – though developing at a rapid rate and getting established by the turn of the century – did not by far make up for the very serious want of capital. Especially in the period between 1850 and 1870 the former landlords were forced to apply the most extensive management methods possible on their farms. Many of the owners of large estates let their lands on lease at that time, mainly to tenants well provided with capital, and those who managed their farms by themselves were compelled to find other solutions to overcome the shortage of capital. They tried to pay labour – at least temporarily – in kind, that is, to satisfy the large numbers of landless and smallholder agrarian proletariat by letting lands on lease on a fifty-fifty or one-third basis, employing them in share harvesting, etc. Harvesting was usually performed by share croppers, while hoeing and other tillage operations by labourers working

for half or one-third of the crop. The permanent servants of large estates as well as of larger peasant farms too were paid mainly in kind. They were employed for lodging, care of cows, land use, some grains, timber, clothes, and only a fraction of their salaries was paid them in cash. This system was characteristic of the whole capitalist era of Hungarian agriculture, only the inner proportions changed with time; in the course of development the number of day labourers working for cash payment increased to some extent, and the proportion of cash money in the wages became higher, respectively.

Hence the large estates were forced to carry on extensive farming, since they had insufficient capital; it was, therefore, only too natural that for decades they did not primarily strive for developing the capital-intensive livestock branch, but making use of the new European boom in cereals in the fifties changed over to a large-scale grain production. This was coupled with a second boom in wool in the fifties which opened the way to developing the least capital-intensive livestock branch: sheep breeding.

This was the only possibility of peasant farms, and especially of the poorest peasants set free in 1848 completely landless or with lands of only half to two hectares. Serfs having owned whole or fragmental plots before 1848 were set free with some lands, grounds, arables, pastures, meadows, forests. The overwhelming part of the cottars, however, were given only pieces of the common pasture or forest used in common. After the separation of seignioral and peasant lands peasants tried to plough up the allotted parts of meadow or pasture and convert them to arable ones to be able to produce at least the amount of grain required for the family. Beside the boom in grain crops this represented an additional force in promoting the conversion of pastures and meadows to arables after 1848. As we shall see, all this reduced the possibilities of livestock breeding for decades.

The other factor that influenced the situation and development of Hungarian agriculture – and livestock husbandry within it – in the second half of the 19th and first decades of the 20th century was the peculiar economic relations established between Hungary and the western half of the Hapsburg Empire after the end of the struggle for independence in 1848–49. Before 1848 there was a customs frontier between Hungary and the other parts of the Hapsburg Empire which was abolished on 1st October 1850; from that time on Hungary was a part of the uniform customs area of the Hapsburg Empire, then – after the compromise of 1867 – of the Austro-Hungarian Monarchy up to 1918. Besides the union of customs areas and the common customs frontiers Hungary was connected with the other parts of the Empire by an identical monetary system too. Accordingly, from then on Hungary could transport its agricultural produce to other parts of the Monarchy duty free. The frontiers of the Monarchy served as common customs frontiers for its countries which meant that the Monarchy ensured but partial economic independence for its countries, the economy of each country formed a part of the economy of the Monarchy, that is, the Monarchy was a *united economic community* with the partial economic independence of the two main parts: Austria (and Bohemia) and Hungary. Hence the economic symbiosis between Hungary and

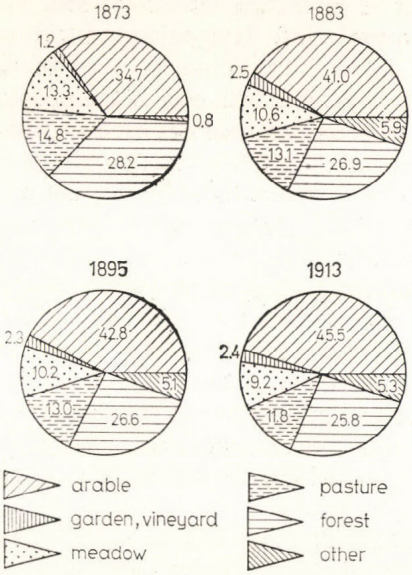


Fig. 1. Distribution of land area, 1873–1913 (in per cent)

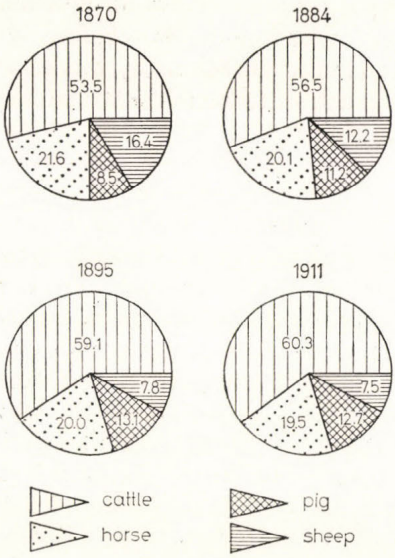


Fig. 2. Distribution of livestock, 1870–1911 (in per cent)

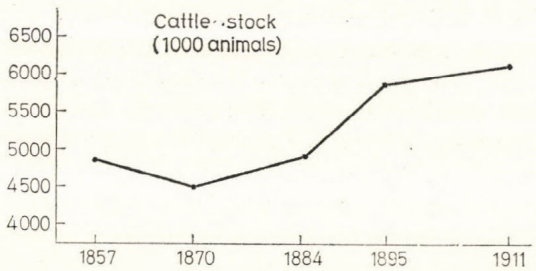


Fig. 3. Trend of the number of cattle stock, 1857–1911

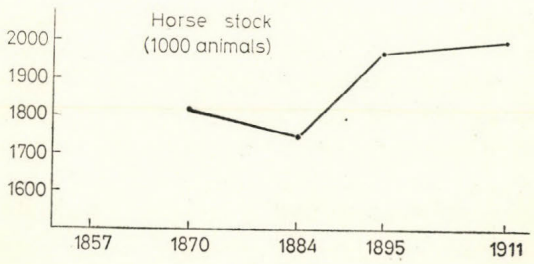


Fig. 4. Trend of the number of horse stock, 1870–1911

the other half of the Monarchy developed at an increasing rate after 1850. The interdependence of Austrian-Bohemian industry and Hungarian agriculture brought about totally new relations in those decades. The economic unity of the Austro-Hungarian Monarchy was a fact to be reckoned with even if the peoples of the countries forming the Monarchy were sometimes turned against each other by the conflicting interests of the ruling classes and the differences of opinion artificially exaggerated by them, and – as a result of this, and of the animosity between the nationalities – the political construction of the Empire rested upon very unstable foundations. We cannot say either that the contemporaries clearly saw that the existence of the Monarchy, the sound functioning of this vast economic unit was *advantageous* to each of its components including Hungary, and not only to the agriculture but also to the industry of Hungary. But irrespective of the fact that the views of the contemporaries were influenced and distorted by the interests of certain areas and groups of economic life, and irrespective of the subjectivity of the succeeding generations, the whole economy of Hungary undeniably developed at a rapid rate between 1849 and 1918, especially in the second half of this period, and agriculture had a part in this rapid progress.

Let us see what the economic development taking place in those decades was like. Those factors have to be pointed out in the first place which determined the development of agriculture as well. If we compare the picture of Hungary before the First World War to that in the 1850s we find enormous changes. The dimensions of industrialization were colossal, though when compared with the progress made by the developed industrial countries the change was not nearly so great. The population of the country increased by some 50 per cent between 1850 and 1910, and the number of the urban population increased very quickly; first the capital swelled, but some other industrial towns too started a sudden development. The change in the occupational distribution of the population was a very characteristic measure of the economic development. In the middle of the 19th century nearly 90 per cent of the population of Hungary worked in agriculture; this proportion was reduced to about 64 per cent around 1914, and also the share of agriculture in the national income was some 62 per cent. When compared with the changes taking place in the developed industrial countries this does not naturally seem to be important, but under East-European conditions this change was enormous. Still greater were the changes in the infrastructure, which were promoted by the government with appropriate investments ensured. The regulation of riverways, the drainage operations and anti-inundation work which considerably increased the agriculturally utilizable areas were surpassed in importance only by the development of railway construction. Before 1848 the agricultural products were transported mainly by carts drawn by oxen or horses, and partly on rivers (regulation of the Danube, Tisza made navigable), which restricted the market possibilities to a great extent. True, the regulation of rivers had not even been completed when the construction of railways began in Hungary, which then changed the transport conditions of agriculture radically. As a completion of the railway lines built on the western, Austrian-Bohemian areas of the Hapsburg

Empire, railway construction in Hungary started first of all with the view to making the transporation of agricultural produce possible. The first 46 km section was opened in Hungary in 1846, and railway connection between Budapest and Vienna was realized in the fifties. This was followed by a more rapid extension of the Hungarian railway system. Pest (Budapest) became the centre of the Hungarian railway system connecting the largest centres of agricultural production to the European railway network. In 1854 Szeged, in 1857 Temesvár and Debrecen, in 1858 Nagyvárad and Arad were joined to the railway network. The Transdanubian railway system connected the agricultural production of Hungary with the markets of Graz on the one hand, and with Trieste, on the other, which from 1860 made way for sea transports from Hungary. The largest districts of grain production and livestock husbandry as well as the sites of industrial raw material occurrence thereby were linked to the transport network. By 1866 a 2,160 km stretch of railway line was ready and in the meantime transportation by water and road increased as well. Between 1851 and 1867 the volume of commodities transported on the Danube increased from 0·5 to 1·2 million tons. The length of public roads grew from 2,030 km in 1848 to more than 21 thousand km by 1866. It was after the Austro-Hungarian compromise of 1867 that railway construction showed a real upswing. By 1873 the length of the railway lines increased threefold, to 6·3 thousand km, in 1900 it was already 17 thousand and in 1913 more than 22 thousand km. The main and side lines functioning then, and the relatively dense network of local railways provided up-to-date transport possibilities for agriculture too(12).

But no matter how rapidly the economy of the country grew, including the non-agricultural sectors, the rapid growth and modernization of agricultural production was not even after 1850 based primarily on the economic development of Hungary, although, naturally, it had some part in it. The increasing urban population, the growing demand for industrial raw materials, which accelerated especially between 1890 and 1914, contributed to the development of agriculture, but was not the main force that determined developments. The general European boom was initially the mechanism of the development of production, gradually being replaced by the rapid economic growth of the developed industrial half of the Austro-Hungarian Monarchy: Austria and Bohemia. The intensive economic growth of the more industrialized countries of the Monarchy, the rising living standard of their populations were the important factors accelerating the development of agricultural production in Hungary. The market of Hungarian agricultural produce was extended in this way becoming the basis for the rapid development of Hungarian agriculture. Around 1910 both in Austria and Bohemia only 38–40 per cent of the population made its living by working in agriculture, the larger part was engaged in industrial, commercial and service activities. The increased population in the Austrian-Bohemian industrial towns, the fact that from the very beginning the population there fell away from agriculture much more intensively than the similar level urban population in Hungary, still closely attached to the land – all make it understandable that it was the developed industrial parts

of the Monarchy rather than domestic consumption that primarily provided the market for Hungarian agricultural production. While in the 1850s and 1860s Hungary exported mostly *beyond* the customs frontiers of the Monarchy, by the end of the century agricultural exports were restricted almost *exclusively to the territory of the Monarchy*, however, the Monarchy imported a considerable volume of additional agricultural produce outside the Hungarian exports too.

Of course this did not happen overnight. The enormous cereal boom evolving in the 1850s was not yet based exclusively on the market provided by the industrialized part of the Monarchy, considerable volumes were still exported at that time beyond the frontiers of the Monarchy, in the first place to the German provinces, but also to more distant Western European markets, e.g. to London. Then when the grain prices were depressed by an increased overseas competition, and the Western European markets, first of all in France and Germany, were blocked for the Hungarian exports by the introduction of protective duties, Hungarian agriculture based on the predominance of grain production came to a crisis. It was from this crisis of the 1870–80s that Hungarian agriculture was relieved by the progress of the industrial part of the Monarchy, and the rapid extension of its markets. The progress was so great that even the increased Hungarian production could not satisfy the demands, and at the turn of the century, and especially in the early 1910s, the Monarchy – besides absorbing the almost total agricultural production of Hungary – imported agricultural produce from abroad too. By that time generally 90 per cent of the Hungarian agricultural export, and of certain products almost the total export (e.g. 95 per cent of the cattle exports, 95 per cent of the grain and flour exports, 94 per cent of the wine export) found markets within the Monarchy. Only a few products (sugar, timber, feather, eggs) were exported in larger quantities beyond the frontiers of the Monarchy(13).

In spite of the relative acceleration of industrial development agricultural exports played a highly important role in the economic life of Hungary. The structure of exports before 1848 underwent a gradual transformation. The agricultural produce maintained their dominance especially in the first decades, only the livestock products were substituted by the cereals after 1848. Up to the eighties of the last century only data difficult to control are available. But even in the 1880s about 80 per cent of the Hungarian export was represented by agricultural product, and by the end of the period this proportion only decreased to 70 per cent. As for the years between 1882 and 1913 Table I (14) will convince us of the great importance of agricultural exports. Even if only the major items are considered we find the share of agricultural produce in the total exports really significant.

Although we can obtain a realistic picture of the development of agricultural production by examining the agricultural exports from the 1880s on, however, this Table does not give information on the conditions of 1850–70. It is clear, all the same, that the trend of development in Hungarian agriculture – though dependent partly on transportation, partly on the development of processing and preserving technologies – was primarily determined by the demands of the boom. In the years following the abolition of serfdom, grain production and parallel

Table 1. Shares of major agricultural produce in the total exports of Hungary (%), 1882–1911

Year	Cereals	Flour	Sugar	Slaughter and draught animals	Livestock products	Total
1882–1891	21·5	11·9	1·3	16·6	3·7	55·0
1892–1901	19·2	13·4	2·8	17·1	4·5	57·0
1902–1911	17·4	13·7	3·1	15·9	4·8	54·9

with it sheep farming showed an upswing in accordance with the second boom in wool. After the separation of seignioral and serf lands – as mentioned before – a considerable part of the meadows and pastures was ploughed up and converted to arable land. In the 1850–60s extensive drainage and canalization work began which again made an area of considerable size fertile, first of all for the purpose of crop production. In the 1850–60s, however, new arable areas were obtained, primarily by ploughing up pastures and meadows. Although there are no precise statistical data available on those years, there are reliable estimates at the beginning of the 18th century according to which the arable area of Hungary was 5·35 million ha, that is 18 per cent of the territory of Hungary, while at the end of the 1860s it was around 10 million ha, about one third of the total area(15). This growth – as we have mentioned – was mostly the result of meadows and pastures having been converted to arable land.

This excessive growth of the arable area is the only explanation of how cereal production in Hungary could increase to such an extent as it did. The extremely low grain yields of 5–7 q/ha even in the first half of the 1870s did not rise for a while, the upswing in cereal production was exclusively a result of increases in the area of arables (Table 2). As for this upswing of production there are no precise statistical data available, only estimates. We can follow in the first place the grain export of the Monarchy, and even from that essential conclusions can be drawn. In spite of the fact that in the 1850–60s the average per capita cereal consumption grew (by some 20 per cent) both in Hungary and in the western part of the Monarchy, from the middle of the 1850s the Monarchy – which in the early 1850s was still compelled to import cereals – exported a constantly increasing volume of bread and fodder grains. It was characteristic above all of the extension of Hungarian cereal production (since the grain export of the Monarchy originated *exclusively* from Hungary) that imports in the early 1850s were replaced by 1867 by exports of about 9 million q bread grain and flour, and 3 million q fodder grain and maize(16).

All this was – of course – evoked by the sudden advance in grain prices. From the years of the Crimean War between 1850–51 to 1854–55, the price of wheat rose by 130 per cent. The price trends of other grain crops – including maize – were more or less similar to that of wheat. The growth of cereal production in Hungary was accelerated at the very beginning of the fifties by the price advance, which around 1855 overstepped the frontiers of the Monarchy. Although after the Crimean War grain prices fell, at the beginning of the sixties a new wave of

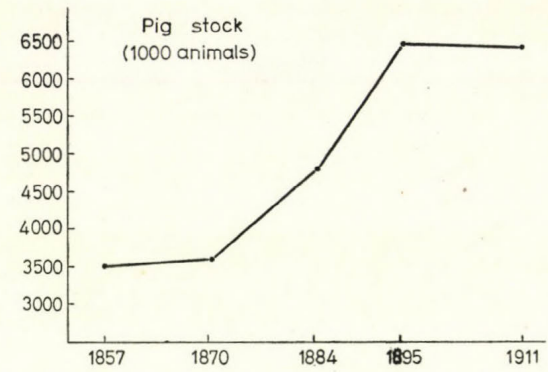


Fig. 5. Trend of the number of pig stock, 1857–1911

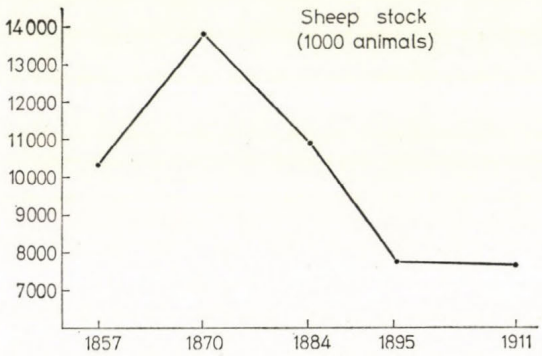


Fig. 6. Trend of the number of sheep stock, 1857–1911

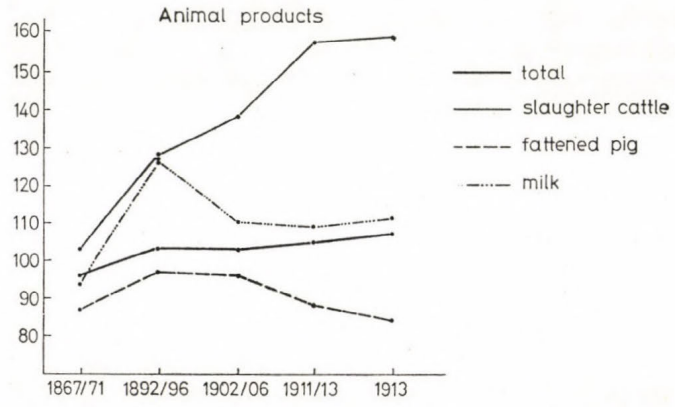


Fig. 7. Changes in the agricultural prices, 1867–1913

Table 2. Distribution of the area by branches of cultivation (in 1000 ha)

Year	Total	Arable		Garden		Meadow	
		ha	%	ha	%	ha	%
1873	27 884·2	9 663·3	34·7	?	?	3 704·3	13·3
1883	28 280·1	11 584·4	41·0	347·7	1·2	2 993·6	10·6
1895	28 105·6	12 030·8	42·8	376·0	1·3	2 864·9	10·2
1913	28 227·5	12 833·7	45·5	378·8	1·3	2 610·9	9·2

price advance started which culminated in 1873. This increase in prices – though not reaching the peak of 1854 – remained always above the prices of the years 1850–51, at least by 70 per cent on the average of the period(17). The above described price trends were already parallel to those of the world market. By extending the railway system and increasing the waterways, Hungary entered the world market with the trade of grain crops. As a result the production of grain crops and maize grew. Compared to the beginning of the 19th century the production of wheat and rye increased twofold, that of barley and oat more than twofold (from a total of 20 million q to more than 40 million q), and maize production at least twelvefold (!), from about 1 to 12 million q(18).

This favourable trend of grain prices pushed all other sectors of agriculture into the background. The decrease in the acreage of pastures and meadows greatly limited the possibilities of livestock breeding, especially those of cattle rearing. The prices of grain (with the necessary inputs taken into consideration) were so favourable compared to the prices of any other agricultural produce, that fodder cultivation on the area converted to arable – which was the only possible way of developing the livestock branch – was out of question. This was coupled by the earlier mentioned general shortage of capital which caused a considerable setback in livestock breeding, first of all on the large-scale farms. Even if reliable data on the distribution of livestock are not available we have ample evidence of the large-scale farms, one after the other, having sold almost all their livestocks (keeping only the draught animals) to change over to one-sided grain production. The earlier described transformation of work organization on large estates following the abolition of serfdom did not at all favour the labour-intensive branches of livestock rearing in those decades. This was the reason why even large-scale farms could not make use of the possibilities already available in those years in the marketing of animals and animal products on the territory of the Monarchy. These were indicated by the trade of animals on the common customs area of the Monarchy, which in the 1850–60s was consistently passive, with an annual number of 14–15 thousand beef-cattle and 200–600 thousand pigs(19). Hence Hungary could have considerably increased the slaughter animal production even if relying only on the markets of the common customs area.

That it still did not happen in those decades was caused – besides the cereal boom – by a temporary decline in the farming of large estates after the abolition of serfdom. This transition took at least two or three decades. Before 1848, on the large-scale farms managed tax-free and with unpaid serf labour, the structure of

Vineyard		Pasture		Forest		Other	
ha	%	ha	%	ha	%	ha	%
339·9	1·2	4 113·5	14·8	7 875·5	28·2	2 187·9	7·8
358·0	1·3	3 709·6	13·1	7 598·3	26·9	1 688·3	5·9
281·5	1·0	3 660·9	13·0	7 475·7	26·6	1 415·8	5·1
303·1	1·1	3 323·0	11·8	7 280·2	25·8	1 497·8	5·3

production changed, since not even the taxes could have been paid from the very low output of animals maintained on the vast pastures under extensive conditions. So the pastures were ploughed up. The herds and studs grazed on them were mostly sold by the landlords to alleviate the monetary shortage, then from the money thus obtained, the necessary equipment was purchased and the working capital indispensable in farming raised. The possibilities of peasant livestock farming were equally limited for similar reasons, mainly as a result of pastures and meadows having been converted to arables.

In the 1850–60s livestock husbandry came thus to a crisis. The reasons are quite clear, especially when considering that the area of pastures and meadows decreased from about 10·5–12 million ha at the beginning of the 19th century to 7·9 million ha by the sixties. Decrease mostly took place in the fifties. Roughage was only grown on 2 per cent of the arable area. Livestock farming still was based completely on grazing, and the hay yield of pastures must have been maximum 17–19 q/ha. We must emphasize, however, that this was a national average; radical changes occurred in the output of pastures and meadows. The lowland pastures renowned earlier for their thick grass (from which only the horns of the large grey Hungarian cattle stuck out!) became stunted after the drainage work. According to contemporary estimates in the 1850–60s the output of pastures in the Great Hungarian Plain could not be more than 9–12·8 q/ha, that is, one hectare was able to sustain one or two sheep at the most, and the grazing land requirement of one cow ranged between 5 and 10 ha(20). Under such conditions it was obvious that the numerical increase in the extensively managed livestock stopped. In the Great Plain the livestock, especially cattle, decreased in absolute number, while in the western part of the country, in Transdanubia, where the meadows and pastures were better due to more favourable conditions of precipitation, the livestock increased somewhat. It was at that time that the centre of cattle breeding shifted to Transdanubia where the climatic conditions were more favourable for fodder growing too. On the Great Plain the ploughed up pastures were replaced by arables, where mainly wheat and rye were grown. This resulted, in turn, in an increase in the horse-stock of the Great Plain, where on the sandy soils of the detached farmsteads and small holdings of former cottars lighter, iron-bound ploughs were introduced that could be drawn by horses too; so the horse, since it could be used for conveyance too, became for decades the most important animal on the Great Plain, due also to the extension of the system of detached farmsteads taking place in those decades. The other parts of the country, on the other hand, continued to use oxen as draught animals.

At the time of the cereal boom only sheep were worth keeping. From the fifties up to 1873 the price of wool rose again, however, even with the reduced possibilities of grazing the sheep stock remained at the former level and – for a while – did not radically decrease. Although the available statistical data show an increase in the number of sheep between 1857 and 1870 (for only 11·1 million sheep were registered in 1857 and 14·7 million in 1870), according to sources from 1868 the registration figures of 1857 ought to be increased by at least 30–40 per cent, because after the defeat of the war of independence the executive apparatus of the absolutism was unable to cope with such spontaneous forms of national resistance as with failure to register animals, etc. And this could be most easily done with sheep (and pigs). Thus the sheep stock was about the same in the two decades; its number was somewhat less than in the 1840s when it was estimated to be about 17 million in Hungary. The decrease probably occurred in the first half of the fifties and the number did not rise later.

Sheep breeding, on the other hand, changed as a consequence of the abolition of serfdom. Fine wooled, more exacting sheep were reared at a loss in contrast to the coarse wooled breeds which tolerated the extensive method of rearing well. From the fifties the larger estates no longer tried to improve the fineness of wool, they attempted instead to increase its quantity as that was more profitable. Although the price of coarse wool was not as high as that of fine wool, the profitability with the former was much higher (with the cost of production too taken into consideration).

Contributing to this change, moreover, was the fact that at that time the textile industry was already able to produce good fabrics from less fine wool too, and the demand for finer cloth was gradually replaced by one for coarser, worsted fabrics all over the world. Sheep farming in Hungary responded but slowly to these demands of the textile industry, as the lack of capital in large-scale farms did not allow quick changes in breed. As a result of this Hungarian sheep breeding broke away from its earlier basis, the Austrian-Bohemian textile industry. The sheep stock of Hungary was smaller than in the 1840s, still in the fifties and sixties increasing volumes of wool were exported beyond the frontiers of the Monarchy. In the forties only seven thousand tons were exported. At the same time the wool import of the Hapsburg Empire was very low, maximum 2·5–3 thousand tons. In the 1850–60s, on the other hand, the imports of wool increased to 10 thousand tons in the Monarchy, while the exports (almost exclusively from Hungary) exceeded 10 thousand tons(21). It was at that time that the Austrian-Bohemian textile industry and the Hungarian sheep farming separated from one another which sealed the fate of the Hungarian silk-wool breeds within two decades. So the cereal boom prevented an upswing in sheep farming and in the period of an apparent stagnation prepared, in fact, the rapid decline of sheep breeding.

This period of agricultural development in Hungary which was characterized by an extraordinary boom of grain crops and which, at the same time, meant the changing over from the feudal pattern of agriculture to capitalist production, lasted only for two to three decades. At the beginning of the 1870s grain prices

Table 3. Changes in the price structure of agriculture (1867–1913)

Produce	1867/71	1877/81	1892/96	1902/6	1911/13	1913
Wheat	100·0	107·7	80·3	74·4	76·3	75·0
Barley	100·0	103·6	95·6	92·5	92·6	86·7
Maize	100·0	103·6	90·1	98·3	89·9	90·3
Agricultural products	100·0	105·4	85·9	87·5	94·6	83·5
Beef-cattle	100·0	103·1	128·3	138·1	158·0	159·2
Fattened pig	100·0	86·6	96·7	96·2	88·0	83·8
Milk	100·0	94·4	126·8	109·7	109·3	111·3
Livestock products	100·0	94·5	113·0	112·5	115·4	116·5
Total products	100·0	100·0	100·0	100·0	100·0	100·0

(firstly the most characteristic one: the price of wheat) were still rising, then from 1873 began to decline (Table 3), even if this decrease was not rapid till 1882. It was then that prices suddenly began to fall and this process lasted for more than ten years, up to 1895. At the turn of the century the price of wheat showed a high fluctuation, then from 1907 began to rise again, accompanied, of course, by an increase in the prices of other grains too(22).

The fall in grain prices was not a phenomenon occurring only in Hungary, it was a general world-wide process. After the American civil war the rapidly growing agricultural areas supplied the market with an enormous volume of grain, and as a result of a fast progress in railway construction in a few years the produces of the United States and Canada reached the European markets. The low production costs of the American continent, then the rapidly decreasing costs of transport by railway, and first of all by ship, produced extremely low prices, so Hungarian grains were gradually pushed out from the world market (practically from the Western European market). This was paralleled by an increase in Russian and Romanian wheat shipments becoming more and more competitive from the end of the 1850s, then after opening of the Suez Canal by the competition of Indian wheat; all this resulted in the Hungarian wheat being finally ousted from the markets of Western Europe. Although the transport costs of Hungarian wheat decreased too – by 1895 it was only 53 per cent of that in 1867–77 on the Trieste–London line –, but during the same time the transport costs on the New York–Liverpool line fell to 33·1 per cent(23). But it was the high production cost in Hungary as compared to Russia, Poland, Romania and the overseas countries rather than anything else that caused the low competitiveness of Hungarian grains. Of course, selling wheat or other grains was no problem at all in that period, the grain crisis at the end of the last century was no crisis of selling, that is, it did not cause an accumulation of unsold products. Grains could be marketed all the same, the crisis only meant lower attainable prices, that is, a decrease in the economic efficiency of production. Thus there was a *price* crisis, in Hungary too.

Hungary did not recognize the phenomenon as one of which the effect would be felt for decades, and which would have an impact on the whole of agricultural production. The large estates engaged mainly in grain production were especially

slow in realizing what it meant. First they only thought that the fall in prices was caused by the European record yields and would, therefore, be temporary. It was only in 1882 that they realized that the price of wheat was no longer determined by the yield amounts produced in Hungary, but by the overseas and Russian wheat prices. Namely, yields were good that year in Hungary – while generally poor in Western Europe –, still prices continued to fall. In 1884 when the price of wheat was 19·26 crowns in June and only 15·96 crowns in October, it became obvious that the situation resulted from the increased overseas competition. That the fall in grain price would be of some duration was suggested by the fact that while the grain supplies of America and Russia appeared to be depleted in the 1890s, and the inner consumption of the United States grew rapidly, the world market price of wheat continued to fall, as further overseas areas (Argentine, etc.) entered the competition. The wheat price touched bottom in August 1895 with 12·60 crowns/q(24). This meant the failure of grain production on the large farms.

Another reason why the large farms in Hungary did not initially realize the seriousness of the grain crisis was that inland consumption in the Monarchy continued to grow at a very fast rate even when the grain exports to Western European countries rapidly shrank, consequently Hungarian grains could be sold just as before. As long as the volume of grain exports exceeded the demand of the Monarchy, that is, a considerable proportion of the exports went beyond the customs frontiers, the Monarchy did not follow the more developed Western European countries in introducing customs duties for grains. The demand on grains grew, however, at a very fast rate in the Monarchy, exceeding the grain exports of Hungary as early as at the beginning of the 1880s. Then in 1882 the Monarchy followed the example of France and Germany and introduced import duties on grain (1·19 crowns/q for wheat). In 1887 the tariff was raised (to 3·57 crowns/q), but even this did not help much(25). Prices continued to fall in spite of the fact that any amount of grain produced could be sold on the markets of the Monarchy.

But even in this critical period the cropping area of cereals did not decrease, only its rate of growth became slower, and its share in the total arable area fixed(26). Yet, substantial changes occurred which in a few decades fundamentally transformed the pattern of agricultural production. Namely, the crisis of cereals upset the former price structure of agricultural produce and radically improved the marketing possibilities of livestock farming. Considering that meat and dairy products were more and more sought after by the increasing urban population of Western Europe, and of the Monarchy too, the demand for these products was rapidly rising in those decades and their prices generally increased (the prices of course did not change equally in the different livestock branches). This shift in the price structure in favour of livestock products soon resulted in an upswing of the livestock sector. Even if not overnight, the situation changed. While attention was concentrated earlier exclusively on grain production, from the beginning of the eighties livestock farming became the leading sector of agriculture in Hungary. The pastures and meadows already converted to arables were not, naturally, restored to their former state, but crop production was instead combined with

livestock husbandry. The sowing areas of maize and roughage crops grew, and their share in the arable area became larger too. Within grain production higher importance was attached to the production of fodder grains.

All this meant that both the structure and level of livestock husbandry changed. It was, in fact, in that period that stabled rearing became *general* in Hungary, especially in the central regions of the Carpathian Basin, where a higher than average proportion of pastures and meadows had been converted to arables in the previous decades, and where agricultural production was more intensive than elsewhere. These were, at the same time, the industrially more developed regions of the country, where the proportion of the urban population was larger too, involving wider market possibilities. It was there that the capital – actually the only important inland market of the period – was situated, and this contributed to a more rapid development of the central part of Hungary.

Prosperity thus changed the economic conditions of livestock husbandry and transformed its overall pattern. Livestock husbandry based on up-to-date feeding instead of grazing differed even in its objectives from the rearing methods of the previous decades or centuries. The progress of communication, the rapid technical improvement of processing (e.g. introduction of the milk separator), the increasing marketing possibilities together resulted in the transformation of livestock husbandry. For example, cattle rearing had earlier been aimed at providing draught power on the one hand, and producing (exporting) meat providing thereby the possibility of the cattle being driven to the market, on the other; dairy farms based on stabled or yarded rearing and up-to-date feeding techniques were only established on larger West-Transdanubian estates situated close to the market of Vienna. There was no longer any need for animals to be driven to the market, and with the improvement of the network of roads and of the technical level of agriculture – and above all ploughing (iron plough) – the cattle found a rival in the horse becoming widely employed in ploughing from the second half of the 19th century. And even on farms that continued to use oxen for ploughing, cattle breeds as strong as those used earlier were no longer necessary. Hence the aim of livestock husbandry changed; the necessity of providing draught power was subordinated to the aspects of fattening and milking capacity. Cattle bred one-sidedly for centuries in Hungary was gradually replaced by various dual or triple purpose western breeds, and the specific types developed in the Carpathian Basin in the last decades of the 19th century were all spotted breeds. As a result of these changes in rearing methods and breeds the structure of cattle farming was based on crop production, and the further development of agriculture took thus a new direction (at least for some decades). Similar changes in rearing methods and breeds occurred in the pig branch where the "mangalica" breed, much more fertile and easier to fatten than the native breeds, came into prominence. The spread of this lard-type pig brought about a radical change in feeding. The earlier practice of feeding swine on mast was almost completely given up, especially in the central part of the country, and maize and other field-grown fodder crops became the basic foodstuffs of pigs. Pig-wash only had a role in small peasant farms and with the poorer urban

strata rearing pig. Horse breeding too became transformed; the importance of large-bodied, cold-blooded breeds more suitable for draught work began to increase. Differences in sheep husbandry between the manorial and peasant farms gradually disappeared. All these changes in feeding, and the replacement of breeds – both separately and jointly – testified that from the early 1880s livestock breeding in Hungary was approaching the West-European level, and – though, of course, it did not reach it either quantitatively, or qualitatively – followed the same line.

Prior to discussing the conditions of livestock husbandry prevailing at the turn of the 19th early 20th century in any detail, we have to be informed about another important change. As we have seen, by the time of the abolition of serfdom the production of large manorial farms had separated from the traditional peasant crop rotation system and livestock husbandry based on grazing. Large-scale farms best provided with capital used an up-to-date system of crop rotation even before 1848, and field crop growing generally was co-ordinated with the fodder requirements of livestock (first of all sheep) farming. Even sheep were reared on improved pastures and given fodder as supplement.

After the abolition of serfdom large farms responded to the cereal boom in the same way as the small farms did. In the first place the cropping area was expanded. The abolition of serfdom and separation of peasant lands from manorial lands did not, however, stop at once the traditional shifting of crops. The want of capital in the peasant farms prevented the owners from consolidating their holdings. Shifting of crops was maintained for further decades. True, the new crops, first of all the row-crops (maize, potato, etc.), as well as from the eighties the extension of the sowing area of rough fodders gradually broke up the old patterns and made consolidation necessary. On the other hand, livestock rearing based on the system of common pastures and on the possibility of grazing the fallow strips of land tended to keep up the system of crop shifting. Mainly those peasant owners of small holdings were against the consolidation of holdings who possessed insufficient land to grow fodder crops on in addition to the grains required for the sustenance of their families. The grain crisis resulted, however, in essential changes in this respect too. The attention of the peasantry turned toward livestock husbandry; the extension of the sowing area of fodder crops, stabled rearing introduced in the peasant farms too, gave an impetus to consolidation, elimination of lay lands, and introduction of a better system of crop rotation. This process can be characterized by the following data: the acreage of lay lands decreased from 2·3 million ha in the early 1870s to 1·1 million ha by the outbreak of the First World War, and was mostly restricted to the border lands. In the decades preceding the First World War there was but a negligible acreage of lay lands in the central part of the country(27).

The upswing of livestock husbandry, its co-ordination with the pattern of field cropping transformed thus the traditional structure of crop production as well. But – as we have seen – even livestock breeding itself was transformed. Differences of this kind existing before 1848 between the large manorial estates and the serfs'

farms did not, naturally, cease, but were partly preserved, partly modified. Livestock rearing in small peasant farms made a great progress, large-scale farms continued, however, to hold the first place in livestock husbandry. Large farms mostly endeavoured to raise the qualitative level of livestock breeding. This explains that an overwhelming part of the livestock – except sheep – was found in small farms, further, that for this very reason the livestock structure of large farms was built primarily on livestock breeding and rearing in small holdings. It was characteristic of capitalist Hungary until 1945 that the animals – especially cattle – were reared in small farms, and it was from these peasant farms that large farms purchased draught oxen and young cattle. Large-scale farms took advantage of having begun the change of breeds decades before the small farms, and switched over, therefore, to rearing breeding animals (in all branches of livestock farming), and producing mainly for urban and export markets (in each branch of livestock breeding in a different way). In the cattle branch most large farms operated dairy plants (generally purchased cows from peasants); with respect to breeding, pig production of lard and bacon was the main objective, and in an initial form rearing and processing meat-type pigs; in the horse branch the raising of breeding animals already began. Livestock husbandry in the large-scale farms was built in every respect on the extremely wide system of small peasant livestock farming, numerically exceeding the large-scale farms. Large-scale stocks generally were of better than average quality, yielded more milk, fat, finer wool than those of peasant farms. They were forced to choose this solution because – with livestock husbandry being a highly labour-intensive branch – they were not able to develop all its phases to the same extent. They found it more profitable to maintain a lower number of better quality animals.

It was just in the quality that peasant farms could not keep pace with large-scale farms in livestock rearing. True, livestock density in peasant farms was incomparably higher than in large-scale farms, but this followed mainly from a need of draught power and useful animals in every farm. However, the number of livestock in peasant farms increased greatly. The labour reserves of peasant farms could be very well utilized in livestock breeding the products of which were increasingly sought after in the last decades of the 19th century. The extension of livestock rearing in small holdings meant an increased exploitation of family labour available free of charge. There began a qualitative development of livestock husbandry in these farms too, e.g. the establishment of dairy co-operatives promoted the improvement of the cow stock of peasants in the most developed western regions of the country, nevertheless, it was not this but the higher number of animals maintained which was characteristic of the peasant farm. By the turn of the century, however, the production structure of peasant farms too underwent an essential change in which the leading role was played by the development of livestock breeding.

It must be noted that the main production line of large-scale farms – in spite of what has been told about their qualitative superiority to small farms – was not livestock breeding; they continued to be engaged primarily in crop growing.

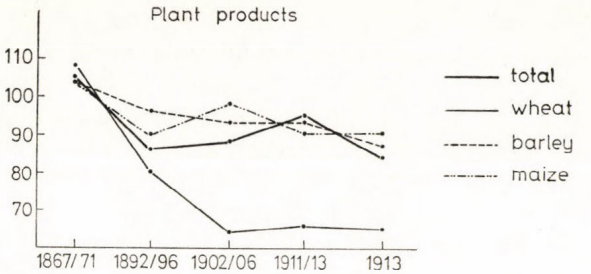
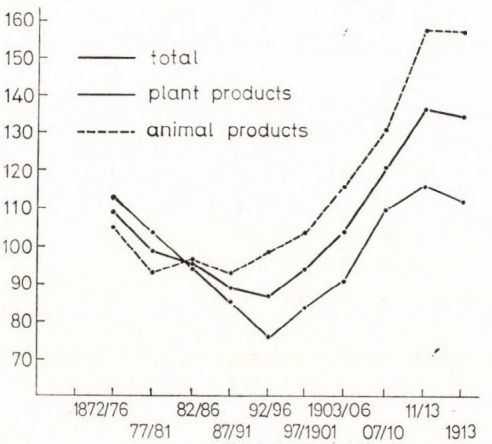
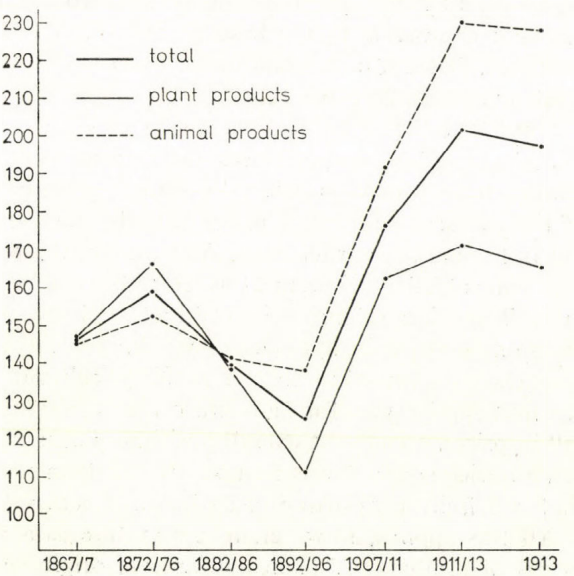


Fig. 8. Changes in the agricultural prices





Figs 9–10. Wholesale price index of agricultural products, 1867–1913

The majority of the large estates, especially in the central and eastern part of the country, maintained their traditional, partly extensive pattern of growing grain crops. Their lack of funds prevented any essential adjustment of production; it was the grain crisis in the first place that limited their possibilities. The overwhelming part of large estates, and especially medium-sized farms, with an acreage ranging from 60 to 6–700 ha, which were not large enough to manage a model livestock farm, did not have the possibility of changing over to livestock breeding in a few years. Their production structure remained traditional, built on grain production; these farms and their owners, respectively, were interested above all in a rise of grain prices. The small farms which did not produce grains exclusively for the market and where family labour made an increase in the number of livestock possible, generally were affected less seriously by the fall in grain prices than were large-scale farms which commanded a stock of commodity grains. It was these large-scale farms that raised the claim of higher grain prices at the turn of the century, and their owners became leaders of the agrarian movement.

All this is clearly seen from Table 4 showing the trends of the wholesale price level of agricultural produce. With prices in 1848–52 taken as a basis, shifts in the price structure indicate the factors that fundamentally determined agricultural development in Hungary and its characteristic features in the second half of the 19th century. From the middle of the 1870s the price level of crop products rapidly sank and even if it did not fall to the initial level, its declining tendency compared to the top level was strongly felt from the second half of the 1870s up to several years after 1900. No doubt, agricultural prices generally show a decreasing trend in that period. While on the average of the years 1867–71 the wholesale price level of all agricultural produce studied exceeded the price level of 1848–52 by 46·1 per cent and in 1872–76 continued to rise by a further 10·9 per cent compared to the base period, from 1877 to 1906 it showed a declining tendency. Prices touched bottom between 1892 and 1896 when exceeding the basic level by a mere 24·5 per cent.

Until 1906 the price level did not reach either the 1867–71 level or the peak of 1872–76. This 30-year period was thus characterized by a fall in prices, a permanent lower price level of agricultural produce, in spite of the fact that around the turn of the century, after 1897, prices slightly increased again, although this increase did not reach the earlier peak. As a whole, the period was still characterized by a permanent fall in prices, and this referred not only to the prices of agricultural produce. The prices of industrial products and raw materials, and of articles of primary importance in agricultural production fell considerably too, sometimes at a much faster rate than the prices of agricultural produce, and this circumstance ensured a price gap for agriculture throughout the whole period in spite of the fall in prices. Hence the overall position of agriculture did not worsen even at the lowest price level; it was by taxes rather than through an agricultural price gap that a definite proportion of agricultural returns was creamed off.

All this applies, however, to agriculture as a whole only. If we consider the prices of products of plant and animal origin separately, a modification in the

Year	Plant	Animal products	Total	Change compared to previous period
1848/52 = 100				
1867/71	147·2	145·0	146·1	+46·1
1872/76	165·8	152·3	159·1	+10·9
1882/86	137·8	140·9	139·4	−12·4
1892/96	110·8	138·3	124·5	− 8·9
1907/10	162·2	190·5	176·4	+37·6
1911/13	170·8	230·3	200·7	+13·8
1913	165·4	228·2	196·9	− 1·9
1867/71 = 100				
1872/76	112·5	105·0	108·8	+ 8·8
1877/81	104·1	93·4	98·8	− 9·9
1882/86	94·3	97·3	95·8	− 0·4
1887/91	84·9	92·7	88·8	− 7·3
1892/96	75·8	98·5	87·2	− 1·8
1897/1901	83·6	103·6	93·6	+ 7·3
1902/1906	90·6	116·1	103·6	+11·1
1907/1910	110·3	131·0	120·7	+16·5
1911/1913	116·1	158·4	137·3	+13·8
1913	112·5	156·9	134·7	− 2·0

Table 4. Wholesale price level of major agricultural products(28)

price level is revealed, a process that determined the situation of livestock husbandry. Within the overall tendency of a decline in prices, the prices of livestock products showed trends other than those of plant products. The general trend of the agricultural price level was determined in the first place by the prices of products of plant origin, which means that their drop in prices was more intensive than average. The prices of livestock products, on the other hand, did not decrease to the price level of plant products, viz. did not reach the rate of decline of the latter, and with the overall tendency of fall in prices taken into consideration, this in itself meant a relative price advance. Characteristically, at the lowest level between 1892 and 1896 the prices of plant products were 75·8 per cent, while those of livestock products 98·5 per cent of the basic prices of 1867–71; in this context it is also worth mentioning that until 1906 the price level of plant products only rose to 90·6 per cent (compared to the base), while that of livestock products exceeded the base by 3·6 per cent as early as between 1897 and 1901, and between 1901 and 1906 was already 116·1 per cent. In other words, the prices of livestock products had increased to a considerable extent before the customs duties were essentially raised.

This trend of the price level caused a turn in the last third of the 19th century toward livestock breeding in Hungary. Since the prices of livestock products did not decrease with the general fall in prices and with the prices of plant products, respectively, moreover their decrease was much below the average in those decades, the increase in their price level began likewise almost a decade earlier than in the case of plant products – consequently it was livestock husbandry of all sectors

of agriculture that made a rather steady progress in Hungary too. This permanent shift of proportions in favour of the livestock husbandry, which characterized the price structure of agriculture over thirty years or so, induced highly important structural changes resulting in the typical pattern of modern livestock husbandry in Hungary.

The transformation of livestock husbandry in Hungary was the result of a long process which could not have taken place without the above described changes in the price structure.

The above modification of the price structure was not, however, enough for the transformation of the pattern of livestock breeding. It only resulted in a *general* increase of interest in livestock husbandry, especially on the part of small farms where the necessary labour force was available. All this may account for the increase in the number of livestock in the period in question, but cannot explain the structural transformation. The changes in the structure of livestock husbandry were decisively determined by the substantial differences in prices that occurred even between individual livestock products.

Within the general trend of price movements the prices of different animals and of their products did not change in the same way. If we only want to outline the major tendencies it is enough to cast a glance at Table 5 (29) to see that the changes in the structure of livestock followed this price trend. Essentially, this consisted of a rather steady increase in cattle prices irrespective of the customs measures. With the prices of 1867–70 taken as a basis, the prices of cattle always exceeded the basic price, and around the turn of the century the rise in prices accelerated without any interference (customs measures). The prices of pig, on the other hand, were characterized by a constant decline touching bottom between 1886 and 1895. The same applies to the price of fat—when related to the same basis—, due mainly to competition by the American fat and bacon. The situation was similar with wool of which prices touched bottom between 1892 and 1896 and never reached the basic price of 1867–71. The extent of fall in prices in wool was

Year	Cattle	Calf	Pig	Sheep	Wool**
1867/70	47·49	92·36	109·37	68·40	315
1871/75	49·36	108·36	117·70	81·17	348
1876/80	48·15	92·10	96·00	77·70	319
1881/85	51·64	92·58	98·37	84·23	294
1886/90	48·76	90·94	89·10	73·69	277
1891/95	53·12	96·14	93·28	69·09	239
1896/1900	57·59	94·27	94·19	72·62	274
1901/1905	65·44	105·01	103·50	77·64	305
1906/1910	75·39	117·24	124·75	94·67	328

Table 5. Price trends of animals and wool in 1867–1910* (q/crowns)

* Prices of the St. Marc Zentralviehmarkt in Vienna. These prices influenced the Hungarian prices. More than 60 per cent of the animals driven to the market originated regularly from Hungarian exports.

** The prices of wool are given with a year's delay. The basic years are 1867/71. From theu on the five-year averages are those of 1872/76, 1877/81, 1882/86, etc. up to 1907/1911.

equal to that in wheat which explained the chronic crisis of sheep farming beside the depression of wheat production. The price of mutton, on the other hand, was above the basic price throughout the whole period, that is why a relatively large proportion of the sheep stock was maintained in Hungary in spite of the radical fall in wool prices. While the volume of raw wool imported to Europe from overseas grew eightfold between 1860 and 1910, resulting in a general decrease of the sheep stock in the European countries, in Hungary this decrease was only 50–75 per cent of that recorded in the developed Western European countries. This phenomenon can be accounted for by the quite high level of mutton prices at that time(30).

All this served as a basis of the development characterizing livestock breeding between 1870 and 1910. Let us see what the figures say.

The numerical development of livestock in the second half of the last century – between 1857 and 1911 – are shown in Table 6.

Considering that our data are but approximately reliable, the absolute numbers of livestock – though not indifferent either – are not as important for us as the *changes* reflected by the columns of figures. Namely, these changes allow measuring the rate and tendency of development and the changes in structure.

The first peculiarity revealed by the columns of figures in Table 6 is the increase in the whole livestock from 1870. With livestock – or at least large animals – converted into standard animals a considerable increase in the livestock can be demonstrated by the turn of the century, or until the 1910s. When using the contemporary key of conversion (1 standard animal-1 cow, or 1 horse, or 5 pigs, or 10 sheep) and disregarding the changes that took place during these forty years partly in the structure, partly in the breeds of the livestock which may have modified e.g. the average weight, we find the livestock to have grown from 8·40 million in 1870 to 10·23 million by 1911 (21·54 per cent). Growth was not uniform at all. Between 1857 and 1870 the livestock only increased by 1 per cent, between 1870 and 1884 by 3·21 per cent, while from 1884 to 1895 the growth was 13·84 per cent (from 8·67 to 9·87 million of standard animal), declining again to 3·44 per cent between 1895 and 1911 (from 9·87 to 10·23 million of standard animal). The highest rate of increase occurred thus in the ten years from the middle of the 1880s to the mid-1890s, i.e. when the grain crisis was at its worst. All this suggests that the situation did not change for the next ten years; further increase in the livestock only began after a considerable rise in the agricultural customs duties. But no matter how it happened, there is no doubt that radical changes occurred in the number of livestock in the last third of the 19th century.

Year	Cattle	Horse	Pig	Sheep
1857	4 775·0	1 769·3	3 499·0	10 261·0
1870	4 496·9	1 819·7	3 573·3	13 760·7
1884	4 879·0	1 748·9	4 803·6	10 852·1
1895	5 829·0	1 972·9	6 436·6	7 813·1
1911	6 184·4	2 001·4	6 416·4	7 697·7

Table 6. Changes in livestock numbers (1000 animals)(31)

This change seems even more important when taking the transformation of the structure of livestock into consideration. An analysis of the absolute number of livestock makes it clear that it was the case of a double process in which the sheep stock of the country decreased at a relatively fast rate compared to 1870, while the cattle and pig stock – and even the horse stock – increased in number. The changes did not, however, take place simultaneously. The reduction of the sheep stock compared to 1870 was then not only substantial – as sheep decreased to about 55 per cent of the original number – but also continuous. Namely, no matter how unreliable the data of 1870 are, all experts are of the opinion that

Year	Cattle	Horse	Pig	Sheep
1857	57·7	21·8	8·5	12·4
1870	53·5	21·6	8·5	16·4
1884	56·5	20·1	11·2	12·2
1895	59·1	20·0	13·1	7·8
1911	60·3	19·5	12·7	7·5

Table 7. Changes in the composition of livestock (%)

the figures must have been much higher than that. With the other animal species, on the other hand, a higher rate increase only began after the mid-eighties. As we have seen, increases in livestock number accelerated between 1884 and 1895 and were even more rapid in the case of pigs and cattle; increase in the number of the latter made up an overwhelming part of the total increase, since the horse stock grew but slightly, and the number of sheep decreased. As a result the structure of livestock underwent radical transformation in these thirty years. From the beginning to the middle of the 19th century sheep breeding was the leading branch of livestock farming. From the 1870s this situation changed fundamentally. When studying the changes in standard animal number (Table 7) we find the cattle to have been 53·5 per cent of the total livestock in the 1870s, and 56·5, 59·1 and 60·3 per cent in 1884, 1895 and 1911, respectively. The joint share of cattle and pig in the total number of livestock rose from 62 per cent to above 72 per cent. This circumstance meant the radical transformation of the livestock. Livestock breeding assumed an intensive character since the stabled forms of livestock farming – primarily cattle and pig breeding – became dominant instead of the relatively extensive branch of sheep farming.

Another question must be touched upon. We have hardly any data on small animals complementing the livestock, beside the large animals, e.g. on the poultry stock. There are some data available concerning the size of the poultry stock from 1895 when it comprised more than 29 million fowls. Though this is not a high number but – when added up with the constantly increasing export – indicates that small animals played a considerable role in livestock farming. Beyond this, however, there are indirect data suggesting these components of the livestock to have shown signs of a considerable increase at the end of the 19th century.

This increase in livestock number must be compared, however, to the population number as well. In the last third of the 19th century decisive changes occurred

in this field too. At that time, namely, increase in the number of livestock was already unable to keep pace with the increase of population. In 1884, 602 standard animals fell to 1000 people. Between 1884 and 1895 the rapid increase in the livestock still exceeded the increase in the number of inhabitants: in 1895, 616 standard animals fell to 1000 people. From then on, however, animal density relative to the number of inhabitants was not only unable to grow, but even the attained level could not be maintained. By 1911 only 554 standard animals fell to 1000 people in spite of the fact that extensive emigration took place in the meantime, and the increase in population slowed down anyway at the turn of the century. Livestock number relative to the number of inhabitants was decreasing at that time. This relative loss appearing thus in livestock products could only be made up for by increased yields.

The decrease of livestock did not, however, occur in all species. Even the per 1000 head decrease in livestock number expressed in standard animal does not mean the same trend for each species. When examining the absolute numbers of individual species we find the following trends (Table 8).

Increase in the number of stock gave thus different results for each species. Decrease in sheep number – even when related to 1000 head – reduced the size of the livestock to a considerable extent. The per 1000 head number of horses decreased too, though not significantly. The notable increase in the cattle stock between 1884 and 1911 was just able to keep pace with the increase of population; the number of cattle per 1000 head was about the same in 1884 and 1911. Pig was the only species in which increase in numbers exceeded the increase of population. Numerical increase in the pig stock was especially impressive between 1884 and 1895; even a subsequent swine-fever that reduced the stock could not decrease the 1884 ratio of pig number per 1000 head. No doubt, however, that without the losses caused by the swine-fever the number of pigs could have been much higher, and the per 1000 head pig number too would have increased considerably. Anyway, only the pig stock of all animals was able to keep pace with the given rate of population increase.

In spite of all this, numerical increase and structural transformation in the livestock were equally significant in the four decades between 1870 and 1911. But still more important was the qualitative change (we may safely say: improvement) of the individual animal species. To understand this, however, we have to know the peculiar position and development of each branch of livestock breeding separately.

In the first place we have to study the most important branch of livestock husbandry: *cattle farming*. The overall increase in the number of livestock expressed in

Year	Cattle	Horse	Pig	Sheep
	per 1000 head			
1884	338	121	333	753
1895	363	123	402	488
1911	336	108	343	418

Table 8.

standard animal is mainly the result of an increase in the cattle stock. The 1880s and 1890s were the years of the main increase in the cattle stock too; between 1884 and 1911, however, the number of cattle was increased almost exclusively by increases in the cow stock. In the total growth of about 1·4 million that of cows was 1·3 million. This change occurring in the structure of the cattle stock parallel with an increase in number shows the purpose of cattle farming to have changed all over the country; meat and milk production became more important than draught power production. This circumstance changed also the regional distribution of the cattle stock in the Carpathian Basin. While the livestock was earlier concentrated on the wide rich grasslands of the Great Hungarian Plain, at the same time the density of the cattle stock was roughly uniform in the country —as the draught power demand of peasant farms was everywhere the same—, between 1880 and 1910 the centre of cattle farming shifted to the West- and South-Transdanubian areas having good markets and leading in fodder production too, as well as to the southern part of the Great Hungarian Plain. Besides the excellent grazing possibilities they offered, these areas were near to the new industrial centres. On these areas the rearing method changed essentially; cattle breeding aimed at beef and milk production required stabled rearing and field-grown fodders domineering in feeding. On these areas, especially in Transdanubia, grazing served almost exclusively hygienic purposes, as food was provided primarily by field-grown fodders. There was only one region in the country, Transylvania, where cattle breeding continued to serve traditional purposes: ox rearing. It was here that the method of rearing changed the least, grazing remained its principal basis. Nevertheless, the situation, here too, changed inasmuch as while in other parts of the country dairy farming and fattening came into prominence, Transylvanian ox rearing found a new outlet much more important than the former: the large-scale farms of Hungary met their draught animal requirements from that part of the country. So the method of ox rearing in Transylvania did not remain traditional either, although the transformation was somewhat different than elsewhere.

Changes in the rearing method and modifications in the purposes of breeding influenced the structure of livestock as well. The number of oxen stopped increasing, their share in the total number of cattle decreased, while the percentage of cows increased. It was then that a structural modification began in the livestock of Hungary, which produced proportions similar to those evolved in the structure of the cattle stock in developed industrial countries.

Change in the cattle breeds was, however, much more vigorous. It cannot be said that the change of breeds recorded by statistical surveys started and ended in this period, but the principal phase of the process took place between 1884 and 1911. The main point was that the grey Hungarian cattle was replaced all over the Carpathian Basin by various red-spotted breeds of Central and West-European origin. In the course of a large-scale import activity various breeds were introduced into Hungary; intercrossings between them and with the stock of the Carpathian Basin produced in a few decades—a relatively short time in cattle farm-

ing – a radical change in the composition of the stock. In 1884, 80·3 per cent of the cattle stock still consisted of grey Hungarian cattle; this proportion decreased to 51·6 per cent by 1895, and to 27·8 per cent by 1911. The rapid transformation consisted, in essentials, of the replacement of grey Hungarian cattle providing draught power and partly meat by more intensive *triple-purpose* breeds *equally* suitable for meat and milk production, and for draught work. The red-spotted (Fleckvieh) breed thus evolved in Hungary, and its local types developing relatively early (their origin and development is, even today, an unsettled question) had extremely good qualities combining the favourable features of the foreign breed (high milk and meat yields) with some advantageous properties of the native stock. These Hungarian red-spotted breeds generally were more easy to fatten than the western breeds, and in milk production competed with them.

Transformation did not, naturally, take place in a single step and was not smooth either. The red-spotted breed – though becoming typical by 1911 – only had a share of 57·7 per cent in the total stock. The joint share of the other coloured breeds of foreign origin was still 10·1 per cent at that time, as if indicating the enormous extent of mixing caused by the high-rate diversity of imported breeds. Contemporary protectors of the grey Hungarian breed considered this highly varied import of breeding animals carried on by large farms in those decades very harmful. True, the traditional uniform stock was broken up and numerous breeds appeared in the country, but besides its disadvantages this diversity involved great advantages too. Namely, in the attempts made – and which failed – for several decades the only sound, and ultimately realized, way of development spontaneously crystallized. That is why it was so advantageous that the imports of breeding animals were not restricted for decades, until the Ministry of Agriculture set up the breeding districts (1880–88), and that the measures taken – and finally enacted in 1894 – to make breeding work more or less uniform by setting up breeding districts were never applied in practice.

The rules of economy had a much greater effect than any government regulation. Where market possibilities were earlier available, in the western and north-western regions of the country, the wide introduction of dairy farming induced a spontaneous change of breed much sooner. The grey Hungarian breed of cattle amounted to more than 80 per cent of the cattle stock even in 1884, while western breeds made up already 40–44 per cent on these areas. Then, as the possibilities of dairy farming increased and new outlets opened up, western breeds spread further. By 1911, 91–94 per cent of the cattle stock in Transdanubia and Csallóköz* consisted of red-spotted breeds (!) indicating that it was in those regions that dairy farming took the largest share in agricultural production. On the area enclosed by the rivers Tisza and Maros too, the ratio of the red-spotted breed was above 72 per cent. Change of breed was much less extensive in the Great Hungarian Plain; the red-spotted breed was only represented by some 20 per cent, and an overwhelming part of the stock – nearly 59 per cent – still consisted of

* Area between two branches of the Danube.

grey Hungarian cattle. The Danube–Tisza Interfluve and the eastern part of Upper Northern Hungary occupied an intermediate place; some 54 per cent of the stock consisted in these regions of red-spotted western breeds. The grey Hungarian breed and the buffalo together made up about 57 per cent even in the most traditional parts of Transylvania.

This transformation of breed character cannot be separated from the modification of production and establishment of social organizations intended to increase the possibilities of production and marketing. In connection with this it must be emphasized, however, that on account of the specific Hungarian conditions the functions and social role played by the primarily marketing organizations introduced into Hungary on Western European models were in many respects different from those in Western Europe. The fact that the first co-operatives established in Hungary in the middle of the 1880s were located in Transdanubia, and that later on when at the end of the nineties the co-operative movement expanded, most co-operatives were concentrated in Transdanubia again, may be an indicator of the local character development of dairy farming. However, the co-operative movement was not only an indicator but also a typical means of small-scale dairy farming in Hungary. The first co-operatives based on Danish models initially drew large farms together. However, these were very few in number; in 1885 only 7, and in 1890 18 co-operatives functioned in the country. Owing to their large dimensions the large-scale farms of Hungary were in no need of the co-operative form, their production possibilities were from the beginning much better than those of small farms. The dairy co-operative created opportunities and provided essential means for the small-scale peasant dairy farms. The decisive change occurred in 1895 when the small peasant farms of Transdanubia began to organize co-operatives. The number of co-operatives functioning mostly in Transdanubia, and to a lower extent in the Tisza–Maros region(32) was 146 in 1898, 246 in 1900, 452 in 1902 and 651 in 1907. In other parts of the country their number was negligible. The rapid progress of the co-operative movement was not welcomed by the owners of large estates who believed their monopolies to be threatened by it. They made their dislike felt ever so often.

This is quite understandable if we know the Hungarian conditions of those times. Marketing did not mean any difficulty for large farms, as they only changed over to dairy farming where adequate market conditions had been set up, and their large volume of products easily found their way to the market. The situation was not the same with small holdings and peasant farms which could not compete with large-scale farms either quantitatively or qualitatively, although a larger part of the cattle stock (as of the whole livestock too) in Hungary was owned by small holders. In 1895, 77, and in 1911, 79 per cent of the cattle stock were reared in farms smaller than 60 ha. The value of the higher cattle density of small farms was, however, offset by the about 30 per cent lower body weight of cattle, and 50 per cent lower milk yield of red-spotted cows compared with the large farms (Table 9). The difference in milk yield(33) (data from 1895) was, however, much greater than that, because in the large farms cows were regularly milked all round

Breed	Small-scale farm (below 60 ha)	Medium-scale farm (60–600 ha)	Large-scale farm (above 600 ha)
Grey Hungarian	747	833	959
"Mokány" and "riska" (reddish)	832	1 159	1 219
Red-spotted	1 135	1 394	1 726
Badger-coloured	1 104	1 625	2 181
Other coloured	990	1 297	1 630

Table 9. Annual milking averages (in litres of regularly milked cows in various farm size groups) (1895)

the year, while in the small farms a considerable part of the cattle stock – especially cows of grey Hungarian breed – were still not regularly milked. Hence it follows that the national average of milk yield per cow was extremely low – about 808 litres – in 1895. The replacement of breed promised, however, radical changes in this field too(34).

The adverse conditions of small farms could only be alleviated through the activity of the co-operative system, since the difference between large- and small-scale farms under Hungarian conditions was extremely great, much more than in Western Europe. At the same time the extension of dairy farming in peasant holdings was unfavourable for large farms which were ready to purchase animals for fattening and well-yielding cows from peasants. The owners of large farms thought these possibilities to be threatened by the spreading of dairy co-operatives, therefore they took measures against them wherever possible.

Large-scale farms made use of other advantages of theirs too, such as their favourable position concerning breeding animals. No proper balance of dam and sire could be established since the mid-fifties, the financial means of breeders usually were completely exhausted by increases in the cow stock, which in turn involved a reduced supply of sires (in 1884, 57·9 while in 1911, 59·5 cows fell to one bull on a national scale). This ratio was – of course – much more favourable in large farms where the proper ratio of sires and dams was practically always ensured. It can thus be imagined what the conditions of the peasants' stock were like in this respect(35). The government made efforts to provide sires, in 1894 it established a fund for this purpose which practically meant that sires were either purchased from abroad or raised in Hungarian large farms. The government measures were not, however, able to fill the gap(36), and small farms were financially at the mercy of large farms for decades when they wanted to buy sires.

In short, cattle farming in Hungary underwent radical changes. The dominant breed of red-spotted cattle – as we saw – produced more milk and meat. In 1895 the average weight of red-spotted cows was 337 kg compared to the 287 kg weight of grey Hungarian cows. If we consider, in addition, that red-spotted oxen were slaughtered when four to five years old, while in the 16th–18th centuries the grey Hungarian oxen were slaughtered at the age of 10–12 only, we can understand that significant changes occurred in the output as well(37). The increase of yields considerably exceeded the demands raised by the increasing number of inhabitants.

This was the reason why a cattle stock reduced relative to the number of population made not only a higher domestic consumption possible but increased exports too.

Regional differences must be mentioned separately. In that period Transdanubia became the centre of cattle breeding. There the stock showed the highest density and the change of breed was in the most advanced state. This had an extremely favourable effect on the whole structure and production technique of agriculture in Transdanubia, and served in this respect as a kind of model for other parts of the country too.

Changes occurred in pig farming too, and were of decisive importance for the whole livestock. Around the turn of the century pig farming became the second most important branch of livestock husbandry in Hungary, and it was then that pig fattening developed into a separate industry more or less independent of the farm conditions. Characteristic of Hungarian conditions, this enormous change in pig farming took place in such a way that while the whole structure of pig farming underwent transformation, and fundamentally new forms of management developed, the old patterns survived unchanged. Among urban workers and in petty bourgeois strata pig breeding based on purchased piglets and similarly purchased feedstuffs, or on dish-wash, and mainly serving the purpose of consumption, remained in practice. The peasantry, that is the small farms, switched over to fattening pigs in pens, sometimes grazing them in herds; they fed their own-bred animals partly on pig-wash, but mostly on fodders produced by the farm. A part of these farms put their pigs on the market. By the turn of the century large-scale farms too developed up-to-date piggeries built partly on meat processing. In the 1850s and 1860s large-scale farms raised small numbers of pigs in general, but as the grain crisis arose their interest in pig keeping grew, as it required less investment and offered a more rapid return than cattle breeding did.

When comparing the beginning and end of the period we find the increase in the number of pigs not very considerable. In 1870 there were some 3·57 million pigs in the country; this number rose to 6·31 million by 1911. However, if we examine the development during these forty years in detail we find it to have been very substantial. According to data of Table 6 showing the number of livestock the rapid increase in the number of pigs fell within the decade from 1884 to 1895; the 1884 pig stock of 4·80 million grew to 6·43 million by 1895; this number even exceeded the 1911 figure! Did that mean that by the turn of the century the pig stock of Hungary attained the level it could no longer surpass? This would not have been the case even if we had not spoken of pig farming becoming an independent industry, and of agricultural production and commercial fattening making rapid progress in those very decades. It is only that the swine-fever that had been causing great losses in America for nearly forty years reached Hungary in 1895. The swine-fever first spread in the 1860s to England, then to Denmark and Sweden and later to Germany, and appeared on the large Hungarian pig market of Kőbánya* in 1895. It was a great blow to Hungarian pig farming,

* A district of Budapest today.

since it paralysed the earlier so important exports of live and slaughtered pigs; pork could be sold on foreign markets in a processed form (fat, bacon, salami) only. As an immediate effect, however, the plague took its tithe of the livestock. From 1895 to 1899 more than 1·8 million, from 1900 to 1904, 0·75 million, from 1905 to 1909, 0·94 million while between 1910 and 1914, 0·92 million pigs died or were slaughtered, that is more than 4·45 million in twenty years(38). This enormous loss is reflected by the figures when, at the same time, we find the number of pigs to have stagnated in Hungary between 1895 and 1911. The increase in the number of pigs during the forty years – which, taking the damage by the pest into account, was considerable in spite of the losses – was sufficient to make pig breeding independent of imports. In the seventies of the 19th century a fairly large number of pigs were imported, mainly from Serbia, parallel with the export. By the beginning of the 20th century this import decreased significantly not only on account of the reduced exports caused by swine-fever, but also because increases in the stock rendered imports superfluous.

As a consequence of the swine-fever, at the turn of the century increase in the number of pigs more or less stopped. This did not, however, prevent the stock from improving in quality. As we have already mentioned, it was, in fact, then that the easy to fatten, high lard producing "mangalica" breed became dominant. In 1884 almost 90 per cent of the pig stock consisted of lard-type pigs, mainly of mangalica. The mangalica breed became dominant first of all in the Great Hungarian Plain, the South (the main maize zone of the country) and in the hilly regions. The mountainous border lands were still hardly penetrated by this breed, as the extensive conditions of grazing and management did not meet the high requirements of mangalica rearing; in those regions the former rough-haired breeds remained dominant. The dominance of the mangalica breed involved the transformation of rearing conditions, and grazing was restricted to these mountainous areas. The 10 per cent non-lard type pigs recorded in the statistical surveys were not meat type pigs in the modern sense of the word, but partly "szalontai" and "bakonyi" breeds native in the Carpathian Basin, which never were regularly bred on any larger area, and partly those derived from crossing meat type pigs imported from Western Europe with mangalica.

A qualitative improvement of breeds was brought about by the spread of the modern meat type pig. The dumping of American lard ousted the Hungarian lard from the European markets, and – as a result of an increase in the production and consumption of milk – the demand on lard dropped anyway. Breeding and rearing of meat type pigs were promoted also by developments in cattle breeding and dairy farming (through the by-products) where it was managed on a farm-scale. So it was not accidental that the English meat type pigs were first introduced in the same parts of the country where the dairy farms had spread, and where more favourable markets were available. In the fifties and seventies of the 19th century, at the western border, in the Sopron district, the English (large-white, middle-white, berkshire, yorkshire, poland-china) breeds called meat type pig in Hungary of which the parents had been purchased at the international exhibitions in Vienna

in 1853 and 1873 were widely introduced by the large-scale farmers setting up dairy plants in the vicinity of Vienna. Pure-bred meat type pigs were found nowhere else in the country at that time, and even later spread, but slowly, always in districts outstanding for cattle breeding too. Hence the statistical data showing that in 1895, 15 and in 1911, 20 per cent of the stock consisted of meat type pigs are not reliable, since an overwhelming part of the stock described as meat type consisted of crossed half-bred or quarter-bred pigs. However, we cannot speak of any wider spread of the modern meat type pig since the above mentioned English pig breeds considered in Hungary to be of meat type were registered in England as lard pigs. However, since the output ratio of meat/lard was with these breeds much higher than in the case of mangalica, they were raised as meat type pigs in Hungary. No doubt, however, that the appearance of these western – first of all English – breeds in Hungary at the turn of the century was the first step toward the systematic development of meat type pig breeding. We can thus witness, in pig breeding too, the phenomenon of a breed hardly becoming dominant when another one begins to spread. This was the case with mangalica too, which needed to be protected against more prolific, more profitable meat type pigs even before it could have ousted the former breeds. Meat type pig was undoubtedly the thing of the future.

As we have mentioned changes in the breeds involved the qualitative adjustment of the management method in pig breeding too. Rearing pigs by grazing was almost completely discontinued, and pigs were kept in pens and fed on field grown fodders on peasant farms as well. Modern pigsties and farrowing pens were built, first of all on larger estates, but in many small peasant farms too. Large-scale pig fattening became an independent industry. The largest fattening plant that supplied almost the whole country was the one established near the capital, at Kőbánya (now a district of Budapest) in 1869. It made a rapid progress: by the nineties it occupied an area of about 100 ha, and in 1894, within a single year, received more than 622 thousand pigs. Some one-third of this number was consumed in the capital, the rest was exported(39). The swine-fever – although setting back the production of the Kőbánya fattening plant to a great extent – could not stop the industrial fattening activity. While Kőbánya could never regain its former importance after the plague had been checked, up-to-date fattening plants of smaller capacity were established in other places of the country too, first of all in connection with large estates, whose fodder crops provided a sound basis for fattening. These fattening plants were set up partly at the western frontier, in export market districts: Sopron, Győr; further in the vicinity of larger towns like Pécs, Szabadka, Szeged, Debrecen, etc.(40). This phenomenon, no doubt, contributed to stabilizing the activity of breeding.

In spite of all this the small peasant way of rearing remained the dominant form of pig farming. Increase in numbers appeared first in small farms, large farms endeavoured in the first place to improve the quality of the stock. In 1895, 75·2 per cent of the stock was to be found in farms smaller than 60 ha; this proportion grew to 79·8 per cent by 1911, since due to the swine-fever large farms reduced the number of their stocks. This fact was taken into account in the fattening

industry too, since its activity was mostly built on animals purchased from peasant holdings.

The change of breeds and the improvement and intensification of the method of management resulted in a powerful increase of output in pig breeding. As we have seen pig farming was the only branch of livestock farming where the numerical increase could keep pace with – and in that period even exceeded – the increase of population. Beyond an increase in the number of pigs per 1000 head, in the second half of the 19th century also the output per pig grew considerably; pigs of the mangalica breed were more liable to be fattened than the traditional pig breeds of the Carpathian Basin, so the average weight of pigs practically redoubled by the end of the period. As for fertility, on the other hand, mangalica did not bring any favourable change, as it only farrowed once a year, and then maximum five to six piglets. Significant changes were anticipated in this field too at the end of the period, in the first decades of the 20th century, with the appearance of western pig breeds. Although they did not weigh, when fattened, as much as mangalica did, but developed rapidly and were much more fertile. The main cause of their rapid spreading was, however, the transformation that the demands of foreign markets had undergone, which sooner or later called for a change of breeds in Hungary too. Hence a new upswing was expected in the output of pig breeding too.

Considering the second half of the 19th century as a whole, a remarkable increase is found in the number of *horses* too. The bulk of increase occurred in the fifties and sixties, from which the least statistical data are available. This can be explained with the transformation having taken place in the social and production structure of Hungarian agriculture after the abolition of serfdom. The system of detached farmsteads that evolved subsequently as a result of the cereal boom involved not only the areal extension of the ploughing operation but also the multiplication of transporting tasks, and was thus predestined to broaden the use of horses. The cultivation of light, sandy soils did not require as strong a draught animal as the ox, and the conveyance of produce too could be solved by horsepower. Hence the horse stock showed an intensive increase in the Great Hungarian Plain, while in other parts of the country the change was insignificant. Ploughing was thus performed in two different ways: on the heavier sticky soils of Transdanubia with oxen, and in the Danube–Tisza Interfluve and the Great Hungarian Plain mainly with horses. When in the Great Hungarian Plain the number of horses attained the level determined by the requirements of cereal production, the horse stock of the country practically stopped increasing; the numerical increases between 1895 and 1911 (ca. 30 thousand horses) resulted exclusively from increases in the army's and constabulary's horse stock.

All this determined the distribution of horses among the farms. An overwhelming part of the horse stock was found in small farms as peasant property. More than 86 per cent of the stock was owned in 1895 and 1911 by peasants. The great majority was used, accordingly, for draught work. About one-third of the total stock was gelded, indicating that horses mostly were used for draught work. For

breeding purposes (mainly for export or for the army) horses were seldom maintained in peasant farms; this task was undertaken mainly by large farms.

Even if there were no essential changes in the number of the horse stock at the turn of the century, the qualitative changes were all the more important. At the beginning of the 20th century hardly any trace was found of the small, large-headed, grey-brown horses with bushy mane that were the progenies of an old horse breed in the Carpathian Basin. Horse farming starting in the first half of the 19th century, after 1867 an upswing transformed the total horse stock of Hungary. Besides the requirements of agriculture, the military interests of the government – in accordance with the contemporary strategy – demanded a large number of horses of excellent calibre. For this very reason horse breeding of all branches of livestock farming was what the government paid the greatest attention to and did its utmost for.

The four state-owned horse breeding establishments (Kisbér, breeding exclusively English thoroughbreds; Bábolna specialized in English and Arab horses; Mezőhegyes, breeding English and English-Arab hybrid horses; Fogaras, with Lippizan horses) as well as the four stud-farms supplied high quality horses not only for the state, but through several hundreds of breeding stations (972 in 1912) improved the whole stock of the country. There were, in addition, private studs too, which – while working first of all for export – contributed to the general improvement of the horse stock. This two-way improvement, though still not able to ensure the necessary number of stallions, produced significant results. The state-owned and private horse-breeding establishments were only able to cover 35–40 per cent altogether of the requirements for mating. This made it possible to keep stallions without permission, and no strict measures could be taken against it either, since the state-owned and licensed private breeding stations could not satisfy the demands. Exclusively, only high quality horses were bred for export and other commercial purposes, but the horse stock used by the peasantry was extraordinarily mixed. Many local types developed, and any improvement was extremely difficult, especially on areas of detached farmsteads in the Great Plain. It was only in the 1930s that a crucial change occurred here in horse breeding. Horses used in trade were, on the other hand, thoroughbred animals that won fame both at home and abroad, and made the horse stocks of certain state-owned or private stud-farms much sought-after. Parallel with the growth in number and horse stock of state owned and private horse breeding establishments the export increased in this period. The number of horses exported from Hungary increased from 4 000 in the sixties of the last century to 41 000 in 1895 and more than 62 000 by 1911(41).

Sheep farming in Hungary showed an unambiguous setback. Surveys made in the second half of the 19th century revealed that sheep farming as a whole was declining in Hungary, as all over Europe. When comparing the number of sheep in 1911 with that in 1850 we find a remarkable decrease; even in comparison with the 1870 conditions the stock was reduced by some 45 per cent. However, between 1884 and 1911 the decrease was not nearly as great as in the developed

industrial countries of Europe (except France). This relatively moderate decrease can be explained by the fact that the conditions of sheep farming were not controlled exclusively by considerations of profitability, but also by the existence of large pastures, especially in the eastern part of the country and in the mountains, which could only be utilized by sheep farming. In addition, the function of sheep breeding on the peasant farms – first of all in the above mentioned regions again – showed hardly any change compared to previous decades. The sheep were raised first for milk, partly meat and wool, but mainly for hide. In most peasant farms the bulk of the stock consisted of racka and cigája breeds. On the central areas of the country, in the first place in Transdanubia and the Danube–Tisza Interfluve, part of the peasant farms changed over to rearing merino sheep, especially in the 1870s and 1880s. As a consequence the number of sheep belonging to the racka and cigája breeds decreased from 9·7 to 4·3 million between 1870 and 1895. However, in the same way as the number of the whole sheep stock stopped decreasing between 1895 and 1911, no further reduction in the breeds racka and cigája was found either, moreover, their number increased by 0.2 million. This shows that in these two decades the number of sheep decreased mainly in large-scale farms. The number of merino sheep fell from about 6·2 million in 1870 to 2·4 million by 1911. These figures indicate the position of sheep breeding in Hungary at that time, and the decline of the wool boom, the separation of the Hungarian sheep breeding from the Austrian-Bohemian textile industry made their effects felt first in the decrease of large-scale sheep stocks. It had an influence also on the distribution of the sheep stock in the different groups of farms. The majority of sheep was in the possession of large farms. By 1895 this proportion decreased to 53·4 per cent of the total stock; that was the amount owned then by farms larger than 60 ha, and even this continued to decrease. The rapid liquidation of the sheep stock of large-scale farms at the turn of the century resulted in a mere 40·2 per cent of the total stock remaining in the large farms by 1911.

We shall present here some details on the areal distribution of the sheep stock. Before 1850 a major part of the stock was to be found in Transdanubia, and it was there too, that the merino breed became dominant. At the turn of the 19th early 20th century in this region, and gradually in the central part of the country too, traditional breeds were replaced by merino sheep in peasant farms as well. The racka and cigája breeds became restricted partly to the Great Hungarian Plain, but mainly to the border areas, the alpine pastures of the Carpathian Mountains and Transylvania; in 1911, 3 million of the 4·5 million racka and cigája sheep were found in Transylvania and in the Carpathians. An overwhelming part of the sheep stock in these regions was owned by peasants, large estates engaged in sheep breeding were mostly found in the central areas of the country.

The regional distribution of sheep farming was modified by increasing difficulties in marketing, namely the marketing conditions of other livestock branches – especially of cattle rearing based similarly on grazing – improved at the expense of sheep breeding. Due to more favourable marketing conditions, on areas where

the pastures were better, cattle farming began to push sheep farming into the background. The reduced grazing area and bad marketing possibilities did not lead to the introduction of more developed feeding methods but, rather, the centre of sheep farming was transferred to the eastern part of the country, where the poor alkaline pastures could only be utilized by sheep farming. On these areas the sheep stock remained thus intact, while in the western part of the country the number of sheep was sharply reduced; so within the sheep stock a considerable shift of proportion was caused in the regional distribution.

In connection with this, the new phase of development in European breeding sheep for meat had not appeared in Hungary then. With the import of overseas wool the fine-wooled stocks were replaced by sheep for meat all over Europe, as wool production was no longer profitable. The relatively low rate decrease in the number of sheep in France e.g. was a consequence of the introduction of various sheep bred for meat. At the time of the fall in wool prices France developed higher body weight merino types yielding both excellent quality meat and valuable wool: consisting of the English Dishley merino, the Charmoise sheep and a quickly growing type called merino-precoce. In Hungary, on the other hand, the production of sheep for meat could not be realized. Owing to an aversion shown by the population to mutton its consumption did not increase, and the exports for which France would have been the largest market were reduced by customs limitations. The volume of mutton consumed by the population in Austria and Bohemia did not increase either, so the export of Hungary was hard hit when in 1877 France raised the customs duties of live sheep and mutton. Hungarian exports were then reduced by half. Yet, there were certain changes in this field. In 1911 more than 9 per cent of the sheep stock of about 7·6 million consisted of meat type sheep. So the first steps toward the transformation of sheep farming were taken with the view of compensating for the permanent decline in wool prices.

Besides large animals livestock farming in Hungary was characterized by a number of small animals reared and bred too. From an economic point of view *poultry farming* was the most important of them. Poultry was always maintained in Hungary, but as for the number of fowls extremely contradictory data and opinions were published. The poultry stocks of farms were first registered in 1884 when the number of fowls was found to be 32·3 million of which 66 per cent (some 21·7 million) were hens. The total poultry stock of Hungary was first taken in 1895 when 29·3 million fowls were registered in the country (the fallback in numbers is illusory, registration in 1895 took place at a later date of the year than in 1884, and a large part of the stock had already been consumed). Most of them were hens. There were typical regions of poultry breeding e.g. the Danube–Tisza Interfluve, the southern parts of the Great Hungarian Plain as well as the area enclosed by the Tisza and its eastern affluents (Kőrös, Maros), where stock density was higher than average. Yet, the density of stock was more or less uniform in the country, although on the central areas grazing conditions were more favourable than elsewhere. But since most – more than 90 per cent –

of the stock was kept on peasant farms (smaller than 60 ha), the overall density of the poultry stock was fairly even.

Poultry farming had not attained yet the farming level of large animals at that time. The traditional view of poultry breeding not being equal to other branches of livestock farming predominated until the 1890s. Poultry farming was considered to be a secondary branch of farming, a work to be done by women, which in a large-scale farm where certain particular tasks would have to be carried out by paid workers was not profitable. Naturally, the situation was not the result of subjective considerations alone. The small peasant farm having many members in the family – i.e. unpaid – labour, and where adequate household refuse was available, was the ideal framework for the extensive poultry farming that took place in Hungary at the turn of the century. Similarly large numbers of poultry were maintained by the servants of large farms. Poultry reared in this way was very cheap, and breeding at that price level was not profitable for a large-scale farm.

The largest part of the poultry stock consisted of traditional Hungarian breeds. In the first half of the period in question, hardly any breeding task was solved. Eggs, feather and poultry meat were produced in sufficient quantities, and there was no governmental or social organization engaged in studying the questions of poultry breeding with any intensity. Due to the limitations of transportation, feather followed by live poultry were the most important export products at that time. Neither slaughtered poultry, nor eggs could have been exported in larger quantities owing to the given technical conditions, moreover, their market was not wide enough. It was around the eighties early nineties that the market of eggs and slaughtered poultry expanded, placing the egg and meat yield of the native Hungarian hen stock in the forefront. It was then that experts realized that the Hungarian dunghill hen – excellently adapted to the extensive rearing conditions in Hungary and which was given grain feed only now and then in winter, while in other parts of the year lived on grass around the house, on insects, grains scattered about in the field and farm-yard, or on household refuse – produced low yields and, in addition, as a result of several centuries of inbreeding both egg and meat production declined. The way out of this situation may have been partly by selection, partly by crossing. Both activities were started quite extensively. In 1891, then at the turn of the century again, the Ministry of Agriculture organized an exchange of breeding animals, purchased an improved stock from abroad and attempted an exchange of breeds between regions distant from each other. Accordingly, the improvement of Hungarian barnyard fowls was carried out in two ways, partly with foreign breeds, e.g. the Plymouth breed was introduced in Hungary in 1880–90, the Orpington at the turn of the century(42). A control exercised by the state from 1891 accelerated the process. Between 1897 and 1914 an exchange of poultry was carried out in the course of which 150 thousand imported cocks were distributed in return for barnyard cocks(43). The idea was fairly good but its execution not in the least. The distributed amount could not be enough to transform the enormous stock of poultry, and the breeds

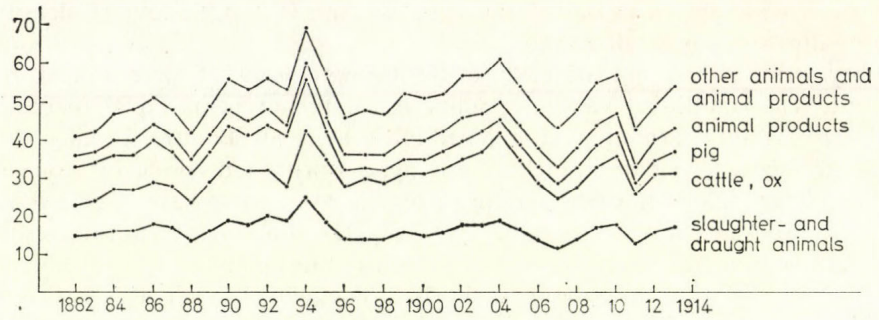


Fig. 11. Share of livestock in the total export, 1882–1913

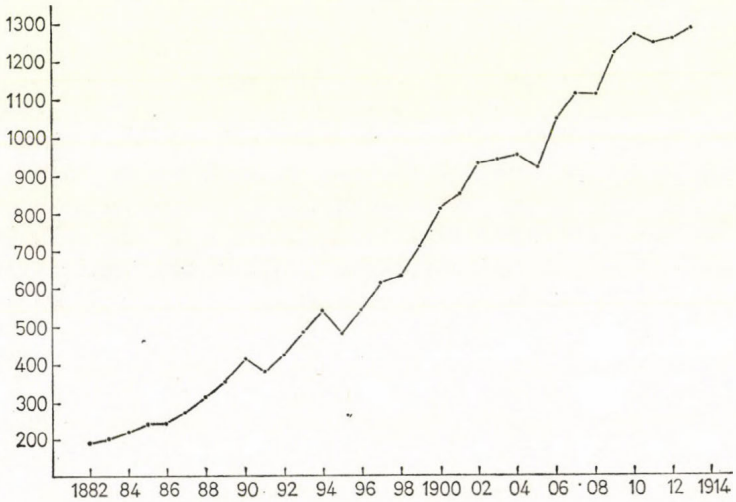


Fig. 12. Export of animal products (1000 q) 1882–1913

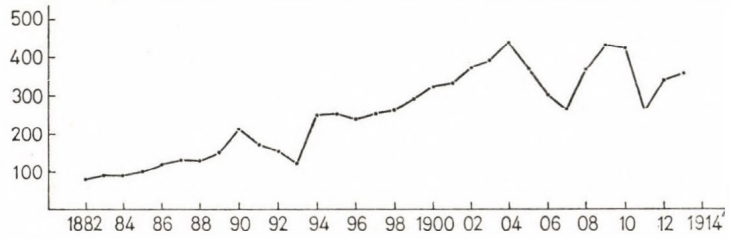


Fig. 14. Cattle export (1000 animals) 1882–1913

were changed according to the frequently changing fashion. As a result in many places extremely mixed breeds developed, which did not mean real improvement. Nevertheless, poultry breeding, as a whole, still showed some progress.

The result of this activity was positive inasmuch as the export of slaughtered poultry and egg increased considerably. At the turn of the century, by the 1910s the export pattern was completely transformed. True, Germany, the largest foreign market, hindered the Hungarian export by various sanitary measures aimed primarily at protecting the poultry breeding of Germany and improving its marketing conditions, but the western part of the Monarchy created such a high demand that could not even be fully satisfied by the Hungarian poultry breeding. Feather which had represented about 60 per cent of the exports was replaced in the structure of export by eggs and slaughtered poultry; the export of live poultry remained roughly at the same level, and so did feather(44), Hungarian poultry farming joining the international trade rather quickly, under the very influence of the market slowly advanced toward transformation. Around the turn of the century large-scale rearing methods began to develop as a response primarily to all foreign, and Hungarian town markets. In accordance with the contemporary conditions in Hungary under which the price level was determined by small peasant farms putting large volumes of poultry on the market at a very low price, these methods were primarily aimed at modernizing the marketing system rather than establishing large-scale production. In certain larger towns of the Great Hungarian Plain, e.g. Kecskemét, Kiskunhalas, Szentes, Orosháza, Szabadka, etc., that is, in the major towns of a poultry district, commercial fattening plants were set up where poultry purchased from peasants at the neighbouring markets were fattened for 8–10 days, then marketed. Large-scale methods were of interest mainly in slaughtering, plucking, drawing, packaging, cooling and transportation. A plant usually kept 20 thousand fowls at a time. Moreover, they even imported poultry for fattening from Romania and Serbia(45).

Development of livestock husbandry in that period is shown also by the data on *export*. The demands of developing industrial areas on livestock husbandry are reflected in these data. Since 1882 regular statistical surveys have been made concerning the export, and the data on the period between 1882 and 1913 give account of essential developments(46). Exports of slaughter and draught animals ranged approximately between 0·9 and 1·13 million a year at that time. The cattle export grew from 84–90 thousand animals to 444 thousand by 1904, then in subsequent years ranged from 300 to 400 thousand. At the turn of the century the export of beef-cattle redoubled (increased from 112 to 255 thousand). Exports of draught oxen and breeding animals too increased rapidly, especially in the 1910s. The export of oxen grew at a rather uniform rate from 75–82 thousand to 301 thousand by 1904. This was followed by a slight fallback; around 1910 it was about 200 thousand. Bull export too was multiplied; the annual 300–500 bulls exported regularly in the early 1880s amounted to 2300–2500 by the beginning of the 1890s. Then the growth of exports accelerated, the number of bulls exported exceeded 19 thousand at the turn of the century culminating with 39

thousand in 1913. The export of cows increased by similar proportions, from 1800–2000 to 6000 by 1893, exceeding 56 thousand in 1904–5 and culminating with 80 thousand in 1910. The number of steers and heifers exported in the early 1900s ranged between 15 and 20 thousand, sometimes rising above 50 thousand. It was similarly in 1890–1900 that the export of calves younger than one year grew, although fluctuation here was, of course, rather high, since the changes in market conditions affected first of all the young animals. The volume of cattle export at least doubled in these three decades, and in certain groups was even higher than that.

Beside an intensive fluctuation *sheep export* showed an essential decrease from the middle of the 1890s. From an annual 200–240 thousand the export fell to 100–130 thousand by 1910, and sometimes was even 30 per cent below this level. *Pig export*, on the other hand, made a substantial progress up to 1895, when the swine-fever appeared in Hungary too. Between 1882 and 1894 exports increased from 600 thousand to 1·3 million, then in the second half of the nineties and at the beginning of the 20th century fell back to 3–400 thousand. Some increase started around 1908, the export was then 5–600 000 a year, and in 1913 almost reached 900 thousand. The causes of this fallback are generally known: the swine-fever was responsible for it, which not only decimated the stock but also almost stunted exports.

The export of horses showed a considerable quantitative increase too, rising from 9000 in the early 1880s to 18–19 thousand by 1896; from then on it was regularly above 30 thousand a year, and as a result of this even growth, attained 52–62 thousand in the first decades of the 20th century.

The export of poultry and poultry products assumed considerable dimensions too. During the three decades the export of live fowls grew about threefold or sometimes even fourfold. Still greater was the increase in the export of slaughtered poultry, which rose from an annual 10 thousand q in 1882 to 135–145 thousand q by the early 1910s. Hence it was in that period that the export of slaughtered poultry became important.

The export of livestock products likewise showed a growth, from 186–200 thousand q to 1·25–1·29 million q. Increase, here too, was thus extremely important. The growth of exports was especially outstanding in milk and dairy products, eggs, raw hide and fats as well as in fresh meat. Some role was played in this by the fact that – as we saw – the export of pigs fell back at the turn of the century, and that of ham, salami and processed meat grew instead. Exports of feather and some other products (e.g. honey) remained more or less the same.

The exports of animals and livestock products increased thus in very large proportions. We have seen the numerical data, and find a similarly outstanding growth when examining the value of export too. The export value of animals and animal products increased from 102 million crowns in 1882 to 575 million crowns by 1913, while its share in the total exports grew from 20·38 to 30·18 per cent(47). Livestock breeding became thus a very important factor in the economic life of Hungary.

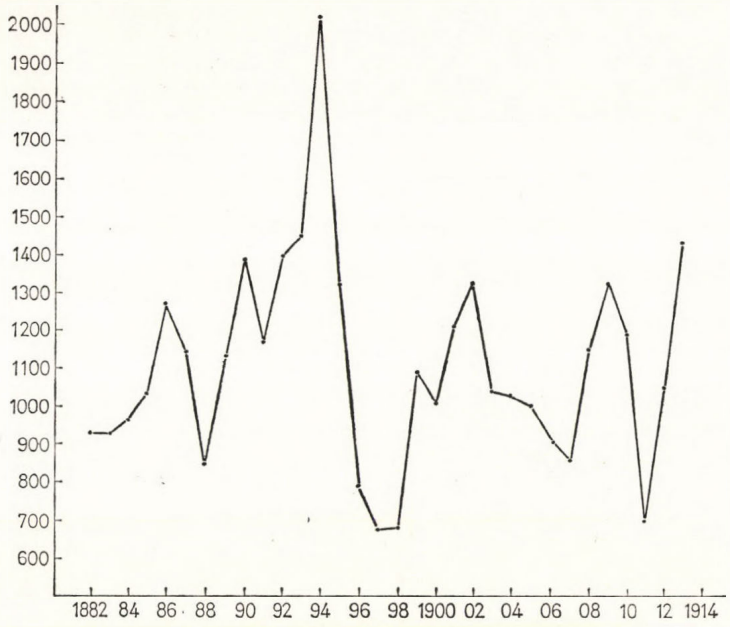


Fig. 13. Export of slaughter and draught animals (1000 q) 1882–1913



Fig. 15. Pig export (1000 animals) 1882–1913

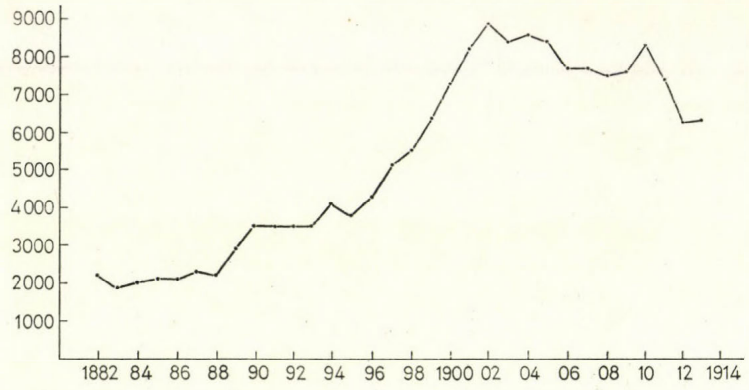


Fig. 16. Poultry export 1882–1913

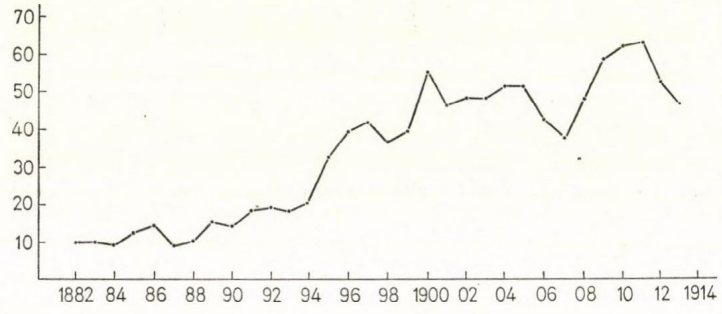


Fig. 17. Horse export (1000 animals) 1882–1913

In the period examined the western part of the Monarchy became the main outlet for animals and livestock products too. Generally 90–95 per cent of the export and in certain cases almost the total export found markets within the boundaries of the Monarchy. With some products, on the other hand, we can witness just the opposite process; the increasing volume of exports decreased the share of the western areas of the Monarchy, because Austria and Bohemia could not receive more products in these branches. Such were e.g. the sheep export, to some extent the horse export, and also the exports of live poultry, eggs, raw hide and especially of feather and other small volume commodities, for which the absorbing capacity of the Austrian and Bohemian areas was exceeded by far by Hungarian exports. These products found outlets in the industrially developed countries of Central and Western Europe, and some of them even in France, although the latter – being itself an exporter – attempted to block its markets from the Hungarian products by high customs duties.

One should not think by any means that a country like Hungary exporting such large volumes of animals had hardly any import of these products. Even

if the increase of imports did not keep pace with the expansion of the export, there is no doubt that up to 1906 imports of most products were growing. Of the countries surrounding Hungary, from Serbia and Romania as well as from the Balkan territories of the Monarchy huge animal imports were realized(48). These animals were fattened in Hungary and expedited to the western part of the Monarchy. One must not think, however, that this import of animals could reduce the volume of Hungarian livestock export to any extent. It had only a supplementary part in the export; the kind and number of the imported animals were primarily determined by their availability in Hungary, mainly when for some reason production in Hungary decreased, or its increase could not keep pace with the expanding demand. The livestock export of Hungary to the Monarchy was only a part of the import carried on at that time by the Monarchy as a whole, and was highly advantageous for the agriculture of Hungary, as by means of this the import fodders could be marketed, etc. How independent the volume of Hungarian exports was from this import is shown by the fact that the increase in exports regularly exceeded the growth of imports, and that, when after 1906 the import of animals and livestock products was radically reduced as a result of a considerable rise in customs duties, Hungarian livestock breeding made up for the losses, from one day to the next and the absence of imports did not cause any difficulty.

The other component of imports was that of animals from Central and Western European countries. Imports from this direction had quite a different role from that played by Balkan imports. Even their volume was only a fraction of the latter, and in practice meant exclusively the import of breeding animals. As we said before, it was at that time that an extensive change of breeds took place in Hungary in almost every field. New, more intensive breeds were introduced, and the import of breeding animals was one of the main approaches. This import – when examined quantitatively – was not significant, but its implications were all the more important. During the 19th century Hungary too became a part of the powerful historical process by which the more intensive Central and Western European breeds entered the countries of Eastern Europe and transformed the pattern of livestock breeding there. The figures on livestock imports from Central and Western European countries show the realization of this process.

As we have mentioned, animal imports from the Balkan countries, Romania and Serbia suddenly stopped, when the increased agricultural customs duties introduced by a law decree in 1906 and enacted in 1907 rendered any further import impossible. Increased protective tariffs are worth being discussed separately, as they reflect the typical situation agriculture and livestock breeding in Hungary got into around the turn of the century.

The gigantic development of agricultural production and livestock husbandry within, it which characterized the turn of the century, did not take place at the same rate in the different regions of the country. It was, naturally influenced by farm conditions too. The development of livestock husbandry, the intensification of the whole agricultural production was felt as a tendency all over the country, but the individual regions gave different responses to the changes. On areas nearer to

the industrial centres of the Monarchy, e.g. in Transdanubia, and especially in its western half, in Csallóköz, etc., it was more intensive than elsewhere. To give a rough characterization of the situation, the proportion of more intensive animal species (cattle, horse) and breeds (red-spotted cow, pig for meat, etc.) was much higher in Transdanubia than in the central and eastern parts of the country; in Transdanubia these intensive species and breeds (and accordingly crop production too) were in a more advanced phase than in the Great Hungarian Plain. In Transdanubia cattle began to push sheep out of the pastures, that is, the centre of sheep breeding started to shift to the central and eastern parts of the country, while Transdanubia took the lead in cattle density. There were essential differences in the distribution of breeds too. In Transdanubia spotted cattle, while in the Great Plain grey Hungarian cattle were dominant. Meat type pigs played, likewise, a much more important role in Transdanubia than in the Great Hungarian Plain, etc. The region stretching from the western frontier to the Danube line was thus ahead of the areas east of the Danube by one phase of development, and differences were even accentuated by the more intensive character of agriculture.

Farmers did not respond in the same way to the consequences of the grain crisis. The peasant farms generally increased the number of their livestock. These farms had a considerable surplus labour to be employed in tending animals and working in the field where the sowing area of grain and roughage crops increased parallel with the expansion of livestock breeding. The peasant farms took part in the development of livestock husbandry all over the country – though at a varying extent and level. In the western part of the country where market possibilities had even earlier attracted dairy farming, peasant farms developed first cow raising, then pig rearing based on the latter, while in the central and eastern parts of the country pig and poultry raising were first promoted, although the cattle stock of peasant farms undoubtedly increased in these regions too. Peasant farms were engaged first of all in livestock rearing and partly fattening. Livestock husbandry in the larger farms was not so uniformly dominant. With the exception of large-scale farms in the western part of Hungary, which produced for Austrian and Bohemian markets, cereal production continued to play a leading role in the management of large estates. Namely, these farms lacking sufficient capital were prevented from changing over to livestock breeding in a few decades. Those farms, on the other hand, starting intensive dairy farming and pig fattening were pioneers in the qualitative improvement of livestock breeding. They introduced new breeds, cows of high milk yield from the west, meat type pigs, etc. and offered an example of improved rearing conditions, more intensive management to peasant farmers. To sum up the tendencies of development: by a quantitative increase of livestock the majority of peasant farms shifted to the more intensive production branch of livestock husbandry, while most large estates (especially in the central and eastern parts of the country) adhered to the extensive branch of cereal production and tried to improve it.

It was, in fact, the demand of these grain producing large estate owners that manifested itself in the request of raising the agricultural customs duties in the

Monarchy. Competition by the cheaper overseas, Romanian and Russian grain crops and the cheap Balkan pork landed these farms – and naturally through them the whole of agriculture – in a difficult position. Their claim strengthened parallel with the competition of overseas products. That it was a claim of large farms alone was confirmed by the fact that the increase of egg tariffs was hardly ever mentioned among the requests, although Russian eggs meant a keen competition for Hungarian producers; but because egg was a typical product of small peasant farms, marketing difficulties were of no importance for the agrarian movement. The interest of grain producing large farms lay thus in raising the customs duties. By the turn of the century the stiff resistance of the industrial circles of the Monarchy (whose interest was to keep food at a low price level) induced these strata to exaggerate the problems of nationality, that is, their fight assumed the form of national policy. That is why the economic agreement with Austria to be renewed every twelve years was postponed in 1897, and an independent customs area was demanded (in which some role was given to representatives of the Hungarian small-scale industry and of certain neglected industries – e.g. textile industry). The attack made in a wide coalition was finally successful. After ten years of ardent political fighting the large estates won; the government party representing the interests of industrial circles and backing the given form of Austro-Hungarian compromise failed at the elections of 1905. Although the coalition of the opposition parties gave up its political claims (essential modifications in the form of the compromise), it did so only when the increased customs duties were put into force in 1906 and enacted in 1907. It is interesting to compare this situation with conditions in England where the much more developed bourgeois strata won in 1846 in the issue of grain tariffs. The divergent results of the fight reflect the difference between the two countries in the development level of economy and, accordingly, of society.

The increase in customs duties – raising the price returns of agriculture by an average of 30–50 per cent – was considerable. The per quintal tariff of wheat, so important for large estates, was raised from 3·57 crowns in 1887 to 6·30 crowns(49). The higher customs duties ensured the total market of the Monarchy for the agriculture of Hungary protecting it from the overseas, Balkan, and Russian agricultural produce. This is reflected in the tables containing data on animal imports, where an extremely great decrease is shown after 1906. The rise in customs duties – which resulted in an intensive increase of agricultural prices – was followed by an upswing in agriculture remembered even today as the "happy times of Franz Joseph" in the memory of the oldest generation. The effect of this increase in customs duties has been much discussed by the historiography of Hungary; it is a positive fact, however, that the annual growth of agricultural production ranging earlier from 1·3 to 1·8 per cent attained 4 per cent between 1906 and 1914. The rise in food prices, on the other hand, caused a considerable strike movement whereby workers achieved an adequate increase in their wages. The demand of agriculture for industrial products grew substantially; machines, fertilizers flowed into agriculture at a much higher rate than before.

The reliable market of the Monarchy as well as the expansion of this market and increase of buying capacity in Austria and Bohemia rendered a development similar to that in Western Europe possible for the agriculture of Hungary in 1880–1910s. In the second half of the last century, but mainly in the 1880–90s, competition by the overseas grains shifted the emphasis in the agricultural development of Western Europe towards livestock husbandry, vegetable growing, orchard plantation and flower production. These countries laid stress primarily on meat, milk and dairy production, vegetable, fruit and flower growing; cereals as well as certain fodders were imported by them. Hungary had considerable amounts of grain surplus, a much higher proportion of the population was engaged in agricultural work here than in the Western countries, so the above described development would not have taken place here – or at least would have reached a much lower level – if the economically more developed areas of the Monarchy had not played the same role the increasing urban population – that is the inner market – had in the countries of Western Europe. Introduction of protective tariffs was one of the signs indicating that the economic level of the Monarchy as a whole had attained that of the Central and Western European countries which also introduced high customs duties to protect their agriculture (e.g. France). All this could not have happened if food requirements in the western part of the Monarchy had not grown at such a fast rate as they did in the second half of the 19th and at the beginning of the 20th century. In Hungary the same process of agricultural intensification – and especially improvements in livestock breeding – was due to the developed industrial areas of Austria and Bohemia which, owing to the uniform customs area, provided a sound market for Hungary. As a result of all this, however, the level of agriculture in Hungary was determined *in this respect* by the developed industrial part of the Monarchy, so it did not depend in the first place on the economic growth of the country. All this was, naturally highly favourable for agriculture – and indirectly for industry too.

Mainly this situation was responsible for the level of development of Hungarian agriculture exceeding so substantially the level of agriculture in Russia, Romania and the Balkan countries at the end of the last century. The latter countries had to tolerate the disadvantages of protective tariffs introduced in the Western European countries against the overseas competition (except those parts of Poland that belonged to Germany, because agriculture here was backed by the German protective tariffs), while Hungarian agriculture, due to the protective tariffs of the Monarchy, could make a progress, its market was more or less ensured. Additional investments involved by intensification, higher production costs were covered by agricultural prices, which under the influence of protective tariffs were much higher than prices on the world market. Before the First World War agriculture was characterized by an accelerated growth and increased intensification in Hungary too. All this was upset for a long time by the First World War.

Notes

(1) The press and economic literature of the early 19th century is full of references to the subject. In his memorandum submitted to the monarch on 4 May 1808, Joseph, Palatine of Hungary, pointed out the dominance of sheep breeding and the lapse of the other branches of livestock farming. S. Domanovszky: József Nádor iratai. (The writings of Palatine Joseph). Budapest, 1935. III. 177.

(2) See again the reports of Palatine Joseph (e.g. on 23 March 1804 he analyses the causes of high meat prices, and later refers again to such phenomena. Ibid. 653.) On meat shortage in the 1810–20s see E. Éber: A magyar állattenyésztés fejlődése (Development of livestock husbandry in Hungary). Budapest, 1961. 163–166.

(3) For summarizing data on price ratios see: Éber: op. cit. 117–118.

(4) For data on the extension of sheep stock on large estates, and on the growth of the sheep stock at the expenses of other livestock branches see: Éber: op. cit. 120–123; L., Gaál: A magyar állattenyésztés múltja (The past of livestock husbandry in Hungary). Budapest 1966. 288. As for the occupation of common pastures by the sheep stock of land lords and its effect on the serfs the statement of M. Táncsics, the famous contemporary politician of serf origin, is cited by Éber: op. cit. 123.

(5) In Hungary, like in all Eastern European countries, the size of landed property was a determinant of social class and strata. In Western Europe the production level of farms was primarily determined by the invested capital rather than by the land. In these countries difference in the production methods no longer existed between peasant and manorial farms in the 19th century, since the latter had been liquidated in some form or other during the previous centuries and was only found in traces. Economic development made the peasant farms equal in rank. In Eastern Europe—as in Hungary too—, on the other hand, the great difference between the manorial large farms (usually larger than 100 ha, sometimes even many thousand ha in size) and the small farms (below 60–100 ha) owned almost exclusively by peasants remained unchanged. There was also an enormous social difference between peasants and landlords which appeared in the whole pattern of their lives, from clothing to eating and other habits. Such great differences were already unknown in Western Europe. And this difference manifested itself in the economic activity, the production of farms too. Only an extremely low number of peasants had sufficient capital to modernize production. Therefore when we speak of small farms it is always about peasant lands, and by writing about large farms we always mean former seignioral (i.e. *by no means* peasant) farms.

(6) Numerous examples of management modernized with the development of sheep breeding in view are cited by Gy. Mérei: Mezőgazdaság és agrártársadalom Magyarországon (Agriculture and agrarian society in Hungary). Budapest, 1948.

(7) Serfs pushed out of the common pastures, and fight for pasture between serfs and landlords, see in Mérei: op. cit. 195–208.

(8) Emphasized by Gaál: op. cit. 265.

(9) Export data summarized by Éber: op. cit. 132–133. For the decade of 1831–1840 see Mérei: op. cit. 30–32.

(10) Éber: op. cit. 171.

(11) For the contemporary situation of livestock farming see Éber: op. cit. 125–130, 136–144, 148–159, 163–172, 175–181; Gaál: op. cit. 256–262, 268–343 and Mérei: op. cit. 24–29, 161–164.

(12) T. I. Berend–Gy. Ránki: Közép-Kelet-Európa gazdasági fejlődése a 19–20. században (Economic development of Central and Eastern Europe in the 19th and 20th centuries). Budapest, 1969. 88–90.

(13) For the export structure of the 1910s see P. Gunst: A mezőgazdasági termelés története Magyarországon 1920–1938 (History of agricultural production in Hungary 1920–1938.) Budapest, 1970. 58.

(14) A Magyar Szent Korona Országainak külkereskedelmi forgalma 1882–1913 (Foreign trade of the countries of the Hungarian Holy Crown in 1882—1913). Budapest, 1923. Magyar Statisztikai Közlemények. New series. Vol. 63.

(15) For the extension of arable areas at the beginning of the 19th century see: Közgazdasági Lexikon Budapest, 1898. I. 689; for the 1860s: Die Boden Kultur-Verhältnisse Österreichs. Wien 1868. For the evaluation of data see Éber: op. cit. 208.

(16) On the basis of data from Die Bodenkultur-Verhältnisse Österreichs, Wien 1868.

(17) Éber: op. cit. 204.

(18) These are approximative data, since we do not know what the hl weight of grain could have been at the beginning of the 19th century. Considering, however, that the improved wheats were widely introduced only from the late 1860s, hl weight can be regarded as having roughly been the same so far. For data referring to the early 19th century see Közgazdasági Lexikon I. 692; for the 1860s: Die Bodenkultur-Verhältnisse Österreichs.

(19) On the basis of data from Die Bodenkultur-Verhältnisse Österreichs. See further: Éber: op. cit. 207, 238–239, 252–253.

(20) For the beginning of the 19th century see: Közgazdasági Lexikon, Vol. I; for the 1860s: Die Bodenkultur-Verhältnisse Österreichs, Wien 1868. The data are interpreted in the same way by Éber: op. cit. 208–209. For the conditions and yields of pastures see: H. Ditz: A magyar mezőgazdaság (Hungarian agriculture). Pest, 1869.

(21) For the demand of coarse wool see: Gaál: op. cit. 418–419 and 424; for the economical production of coarse wool: Éber: op. cit. 244; for the export data: Die Bodenkultur-Verhältnisse Österreichs, Wien 1868. See further: Éber: op. cit. 248–249.

(22) For the price trends of wheat see: Árstatisztika 1867–1911 (Price statistics 1867–1911.) Magyar Statisztikai Közlemények. New series. Vol. 44, 14* and 15*.

(23) Ibid. 17*.

(24) Ibid. 15*.

(25) Ibid. 18*–19*.

(26) For the data see: A Magyar Szent Korona Országainak 1901–1915. évi mezőgazdasági termelése (Agricultural production in the countries of the Hungarian Holy Crown in 1901–1915). Magyar Statisztikai Közlemények. New series. Vol. 66. Budapest, 1924.

(27) Ibid. 44*.

(28) A magyar mezőgazdaság árhelyzete az utolsó évszázadban (1867–1963) (Price conditions of Hungarian agriculture in the last century 1867–1963). Budapest, 1965/6. (Statisztikai Időszaki Közlemények. Vol. 73). 10.

(29) Price statistics p. 27*.

(30) As a further reason, a part of the sheep stock owned by the peasantry continued to serve for the fulfilment of the producers' own requirements (hide, milk, meat). See Gaál: op. cit. 415.

(31) Data of official livestock registration made by the Central Statistical Office.—The documentary value of surveys is analysed in P. Gunst: Livestock Husbandry in Hungary from 1848 to World War I. Agrártörténeti Szemle 1972. Supplement. 26–28.

(32) B. Tormay: Egy fejezet hazánk mezőgazdaságának történetéből (A historical phase of Hungarian agriculture). Budapest, 1901. 22, L. Für: Az állattenyésztés szerkezeti átalakulása a századfordulón (Structural adjustment of livestock husbandry at the turn of the century). A Magyar Mezőgazdasági Múzeum Közleményei 1969–1970. Budapest, 1970. 277; Éber: op. cit. 313 and Gaál: op. cit. 408.

(33) On the basis of registration data from 1895.

(34) The national registration of 1895 estimated the amount of milk produced to be 1 443 million litres. The reason why the average per cow is so low (808 litres) compared with the data of Table 9 is that the latter only contains the data of regularly milked cows, while the amount of 808 litres is the average of all cows. Accordingly, a considerable proportion of cows—mainly those of Hungarian breeds—were not even in 1895 regularly milked.

(35) According to some data from 1881 bulls were 6 338 fewer in number than required for commercial production at that time. In certain counties the ratio of bulls to cows was 1 : 120–150. Éber: op. cit. 308.

(36) Government activity on a larger scale began at the beginning of the 20th century. In 1903, 4 263, in 1913, 8 953 bulls (of which 7 460 were red-spotted bulls of Simmenthal character) were distributed in the country. Éber: op. cit. ibid.

(37) Lecture delivered by János Pirkner at a national conference on livestock breeding in 1910.

(38) Éber: op. cit. 345.

(39) B. Tormay: Sertéstenyésztés. Magyarország földművelése (Pig breeding. Agriculture in Hungary). Budapest, 1896. 256–265.

(40) Ibid.

(41) On the basis of data from the publication: A Magyar Szent Korona Országainak külkereskedelmi forgalma ... (Foreign trade in the countries of the Hungarian Holy Crown in ...).

(42) Z. Mártha: A magyar tyúk nemesítésének első időszaka (The first period of Hungarian hen breeding). A Magyar Mezőgazdasági Múzeum Közleményei 1962. 69–73.

(43) Ibid. 77–80.

(44) For statistical data see: A Magyar Szent Korona Országainak külkereskedelmi forgalma ... (Foreign trade in the countries of the Hungarian Holy Crown...). The structural adjustment of the export is analysed by Éber: op. cit. 363.

(45) E. Hreblay: A baromfi hizlalás és a hízott baromfi értékesítése (Poultry fattening, and marketing of fattened poultry). Budapest, 1900. 8.

(46) See the publication: A Magyar Szent Korona Országainak külkereskedelmi forgalma... (Foreign trade in the countries of the Hungarian Holy Crown ...). Data presented in P. Gunst: Livestock Husbandry in Hungary ... 42–43.

(47) Ibid.

(48) Data ibid.

(49) Price statistics ... 18*.

Chapter 2 Agricultural production in the inter-war period

The First World War shook the world to the foundations not only politically but economically too. It brought to end earlier trends of development and necessarily started new ones. Its effect was felt in every branch of world economy including agriculture. For this very reason the development of Hungarian agriculture cannot be clearly understood without knowing these effects and surveying agricultural production and the evolved general trends.

The tendency of intensified European agricultural production between 1880 and 1910 was entirely overthrown by the First World War. During the war agricultural production in Europe was much retarded especially in France where a large part of the country was a constant battle field for years. But production declined in Russia, Romania and in the countries of the Central Powers as well. This lapse contributed to the increased demands raised by the armies, creating a boom in agriculture too. Making use of the favourable situation, the large overseas exporting countries considerably increased their sowing areas and livestocks. During the war the countries and armies of the Entente, and immediately after the war almost the whole of Europe became an immense market for the agricultural products of overseas countries. Later, when the European production too became by and large stabilized, this significant increase in sowing area and livestock meant an enormous problem. The unsold stocks grew rapidly and the prices suddenly dropped. True, some effect of the economic upswing after 1924 was felt in the increased demand, but it was by no means the same overall boom as in the period preceding the war, especially not in agriculture. So production grew more rapidly than the actual needs thereby increasing again the unsold stocks. Grain surpluses accumulated in the largest exporting countries: Canada, the United States, Argentina and Australia(1) which were 38·7 million q in 1925, 34·2 million q in 1926; in 1927 they amounted to 51·4, in 1928 to 69·2 and in 1929 to as much as 122·5 million q. Growth of production occurred first of all in these large exporting countries.

By 1925–29 the European production closely approached the pre-war level. The sowing area no longer increased, at least when taking the continent globally; all the more was its increase significant in the other large producing and exporting countries. Compared to an average of the years before the First World War the increase in sowing area was 132 per cent in Canada, 68 per cent in Australia, 27 per cent in Argentina and 22 per cent in the United States; in India it was the least of all (Table 10)(2).

This trend was apparent on the other side too. Between 1909 and 1913 Russia

Table 10. Increase of wheat production on the major growing areas (1909/13–1925/29)

Country	1909–13		1925–29		Index	
	area million ha	yield million q	area million ha	yield million q	area %	yield %
Europe	29·3	370·5	28·5	366·5	97	99
Canada	4·0	53·6	9·3	117·2	232	218
USA	19·1	187·8	23·2	223·7	122	119
India	11·8	95·8	12·8	87·2	108	91
Argentina	6·0	40·0	7·7	62·2	127	165
Australia	3·1	24·6	5·2	37·0	168	150
Other countries	6·1	5·3	7·3	6·28	120	125

exported 4·2 million tons, the Danubian States 1·9 million tons of wheat, while Canada, the United States, Argentina and Australia together exported 7 million tons of wheat on a yearly average. From 1926 to 1930 the average amount of wheat exported a year by Russia was only 1 million tons, and that exported by the Danubian States about 0·5 million tons. On the other hand, exports from the four large producers more than redoubled; these countries exported 15·5 million tons in that period. World production grew thus exclusively as a consequence of an increase in the sowing area of these countries, first of all in the war years. This is confirmed by the fact that the average 141·5 million ha grain area in 1909–1913 increased to 155·9 million ha by the end of the twenties. This extension of area seemed slight but, as it took place in the largest exporter regions, it increased production significantly.

A similar process took place during the war and in subsequent years in almost every respect. Production grew considerably not only in wheat but also in rye, barley and maize; the exports suddenly increased – sometimes to a volume four to five times larger than that before the war –, mainly in overseas countries. The same happened e.g. in sugar production. During the war the sugar cane area grew by some 50 per cent which increased the production to an extremely high degree. After the war sugar production increased in Europe too; the sowing area of sugar beet was extended. By 1929 the European production showed a 23 per cent growth, and cane sugar production increased at the same time by 70 per cent. A similar situation developed for meat and milk products too. During the war the livestocks of overseas countries grew (e.g. the cattle herds of the United States, Canada, Argentina and Australia by more than 10 per cent, their sheep flocks by more than 20 per cent); at the same time, as a result of improved transporting facilities and a rapid spread of technical developments (refrigerating cargo boats), large volumes of meat from overseas countries appeared in Europe. Raw meat exports from the United States increased by 41 per cent while from Argentina by 122 per cent compared to pre-war conditions. These trends threatened to completely wipe out the pre-war level of European agricultural accomplishments(3).

This growth of production involved the transformation of consumption structure first of all in the industrially developed countries, and this made the selling

of goods produced by an extended process of production even more difficult. In the industrially developed countries the consumption of meat, milk and dairy products as well as of vegetables and fruits, instead of foods rich in carbohydrates, became dominant. In Europe this tendency was not – perhaps – felt so much, since the average per capita consumption was 99 per cent compared to pre-war years (1910–1914), that is, it was merely stagnant without falling considerably back. On the other hand, in the United States wheat consumption was 84 per cent, in Argentina 87 per cent, in Canada 69 per cent (!) and even in Australia only 80 per cent of the pre-war level. This trend was characteristic of the consumption of all cereals in the industrially most developed countries; thus it was in those very countries which had large exportable surpluses that – beside a higher rate of production – the export availabilities were further increased by the decreased per capita consumption of cereals(4).

The large quantities of produce became more and more difficult to sell, so the unsold stocks were constantly growing. According to certain calculations the contracted index of wheat, cotton, sugar, coffee, silk and rubber stocks in the seven largest producing countries (Canada, Argentina, Australia, New Zealand, India, Indonesia, South-Africa) – with the conditions of 1923–25 taken for 100 – was 119 in 1925, 138 in 1926, 147 in 1927, 165 in 1928 and 194 per cent in 1929. In 1930–31, the first years of the economic crisis, accumulation increased like an avalanche, and in 1931 the unsold stocks amounted to 277 per cent. The joint price level of goods – according to the same calculations – fell from 100 to 64·5 per cent in 1929, and to 27·9 per cent (!) by 1931(5).

It could be easily foreseen that the situation would lead to a crisis. It was in agriculture, and first of all in Europe that the crisis was above all severe. A restriction of production and reduction of sowing areas no doubt, was the most obvious response. In the overseas countries – the United States, Canada, etc. – where agricultural production was based on monocultures and, consequently, the sowing area could be reduced without greater difficulties, these measures were actually carried through. This solution was partly chosen by those industrially developed countries of Europe too where financial means required for the stabilization of a policy like that – restriction of production – were available. However, this was not the case in the countries of Eastern Europe. These countries were forced to increase their food exports to maintain their foreign trade balance; and beyond this, owing to the low endurance of the population, a general poverty and want of capital, the availability of financial means required for the realization of production restrictions was also more scarce than in the United States or other industrially developed countries. That was the reason why efforts to limit production were not successful in Eastern Europe.

Thus the sowing area decreased significantly in almost all overseas countries, especially in the United States most responsive to the crisis, where the government adopted the strictest measures to reduce agricultural production. But considerable restrictions were carried through in the other countries too during the years of crisis. Wheat production regained its 1929 level only by the end of the thirties

when the threat of war compelled the importers of grains to increase their stocks. Maize production showed somewhat different trends; it increased rather than decreased during the crisis. This seems to be related to the fact that with the prices of animal products falling less markedly the number of pigs within the livestock generally increased. This was especially characteristic of the United States where the reduced wheat areas were partly counterbalanced by an increase in the growing area of maize.

The Western European countries fought against the crisis not by reducing the sowing areas; this method could be employed only for a few crops (e.g. tobacco, sugar beet) which did not fundamentally influence agricultural production as a whole. For these countries the only way of self-protection was to press for reduction of imports and increase in domestic production. Those countries carrying on agricultural production in considerable dimensions (e.g. France) protected themselves in the first place by building up tariff walls thus making the import difficult, while countries in want of agricultural imports tried to increase their internal production too by strengthening the autarchic conceptions. This was especially the case in the industrial countries belonging earlier to the Monarchy whose economy was hard hit by the world crisis, since with their former economic relations broken up they became much more vulnerable. This was the reason why in 1935–37 wheat production was 157 per cent in Czechoslovakia and 158 per cent in Austria, and barley production 115 per cent in Austria and 116 per cent in Czechoslovakia compared to that in 1923–25. The situation was the same with row crops; maize production in Czechoslovakia increased by 452 per cent, and potato production in Austria by 475 per cent(6). So in these countries the world crisis brought about a kind of upswing in agricultural production which here and there involved increased yields as well.

The Eastern European exporting countries were vitally concerned with all this, as they could not reduce their production, and the restriction of markets was therefore a catastrophe for them. Such were the conditions of agriculture in Hungary – together with Poland, Romania, Bulgaria, Yugoslavia and the Baltic countries. Hungary which had exported 14 per cent of its meat and fat production, 76 per cent of wool, 21 per cent of poultry, 27 of egg, 64 of feather, 26 of wheat, 17 of barley, 13 of rye, 38 per cent of sugar beet and sugar production, 33 per cent of legumes, 26 of linseed, 48 of clover seed, 28 of tobacco, 20 of flax fibre, 44 of onion, 14 of tomato and 16 per cent of fruit production, got into an extremely difficult position owing to the autarchic tendencies of the neighbouring countries. The decrease of imports and fall in prices, respectively, shook the anyway unstable national economy to the foundations.

The industrially less developed countries, whose foreign trade was more or less balanced by agricultural exports, felt the crisis to a much greater extent, even if a considerable proportion of the population received its salary in kind, and was thus less affected by the financial implications of the crisis. Beyond this, Hungary faced difficulties through another factor. In spite of being a backward agricultural country exporting a considerable volume of agricultural products Hungary –

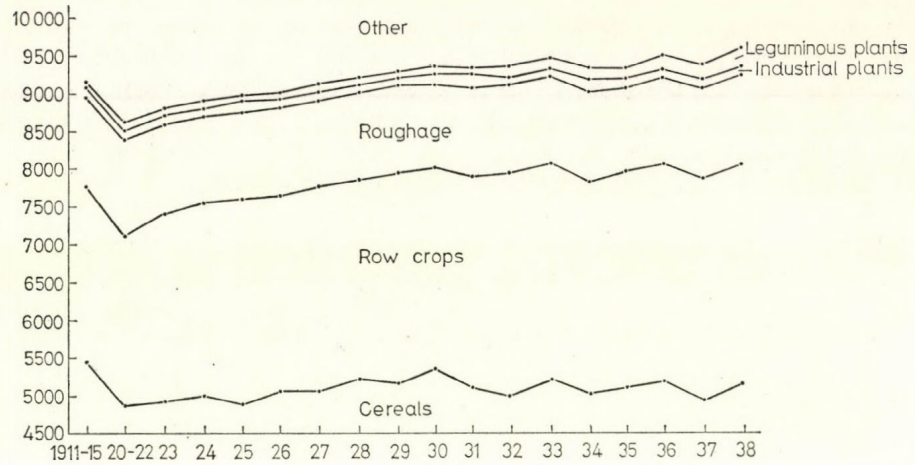


Fig. 18. Distribution of arable area, 1911–1938

compared to the other Eastern European countries – carried on a relatively intensive farming. The prime cost of production was, consequently, rather high which at the low prices meant disadvantages on the *world market*, and often resulted in selling certain products at a price below production cost. In the Eastern European exporting countries (Poland, Romania, Yugoslavia, Bulgaria, the Soviet Union, etc.) farming was much more extensive than in Hungary, and the overseas monoculture farming – though with a similar character but more primitive technical level, much lower wages and lower living standards of the agricultural population, and, in fact, for different reasons – was also more extensive. According to our calculations e.g. – with the prime cost of Hungarian agriculture taken as 100 – that in Yugoslavia was only 46·91, in Romania 51·05, in Poland 89·49 and even in the United States mostly determining the world market prices it was only 81·13 per cent(7). So as a result of the crisis Hungarian agriculture got under a two-way pressure.

All that has been told about the position of agriculture in the inter-war period is characteristically reflected by the trend of yields, one of the numerous indices of the level of agricultural production. At the given level of overproduction, generally at low prices, a decrease or at least stagnation of yields would seem logical. A world-wide uniform tendency, naturally, cannot be spoken of in this respect either. However, this question is important with respect to assessing the agricultural development of Hungary carefully and correctly, and so a detailed discussion will follow.

To get a little closer to the point we must examine the yield averages of a number of countries. In Table 11 we included therefore, besides the yields of European countries, the yields of overseas countries exporting large volumes in the twenties and thirties.

It should be noted in advance that some factors must be left out of consideration, e.g. the effect exerted by the reduction of the sowing area on yields (only higher quality lands were cultivated, etc.), although a true picture can hardly be given without them. Yields in Hungary were undoubtedly lower than in the developed industrial countries of Europe, but – and this is the other side of the same question – much higher than in the European countries exporting large volumes of agricultural produce. And if we cast a glance beyond Europe and extend our investigations to include at least those countries which exported larger volumes of certain products, we may arrive at conclusions even more important than that. Namely, as regards yield amounts, the data of Table 11 divide the world into two radically different parts: countries *exporting* agricultural produce, and those *importing* them. In the majority of the countries exporting agricultural produce the yields either fell back or remained at the same level on an average of the whole period. Any progress worth mentioning occurred only in countries where considerable volumes of produce shown in Table 11 exceeding many times the domestic production were imported and of course, mainly in the thirties. This progress closely coincided with the autarchic tendency induced by the world crisis, when these countries too attempted to satisfy the requirements with domestic products, which naturally involved the development of agriculture and some increase in yields too.

This table has another point of interest, namely, the yields in the exporting countries of the northern hemisphere without exception, and in the countries of the southern hemisphere were mostly surpassed by the yields of Hungary. Apart from a few exceptions, as regards yields, Hungary occupied almost in every case the first place among the exporting countries. The yields of Hungary exceeded not only those of the backward European agrarian countries like Poland, Romania, Yugoslavia, Bulgaria, etc., but also the yields of the large overseas countries supplying the bulk of products sold on the world market. It is not difficult to understand in the case of Argentina, India or the North-African countries, but the case is not nearly so simple with the yields of Canada or the United States. These countries were then at the highest level of industrial development even on a world-scale, so they would have had the possibility of applying all achievements of the era in the development of agriculture. That it was so is clearly shown by the period during and after the Second World War, when American agriculture substantially increased the yields by utilizing the relatively cheap fertilizers of the rapidly developing chemical industry. In the twenties and thirties a similarly favourable economic situation was lacking. That was the reason why in the United States, Canada and Australia the yields of almost all crops were stagnating or fell considerably behind in those times. Agricultural production in these countries was much more extensive than in Europe, potentially it would have thus been much easier to develop.

So it is not so strange that yields in Hungary were lower than in Western Europe, and higher than in Eastern Europe, but that in the twenties and thirties the trend of yields in Hungary reminds us of the lapse and stagnation of yields in the

Table 11. Yields of European countries and overseas exporting countries between 1920 and 1938 (q/ha)(8)

Country	Wheat				Maize			
	1920/24	1925/29	1930/34	1935/38	1920/24	1925/29	1930/34	1935/38
Europe								
Austria	11·3	15·1	15·9	16·5	14·6	19·2	21·3	25·7
Belgium	25·3	26·5	25·8	26·8	—	—	—	—
Bulgaria	8·5	10·2	11·5	13·6	8·8	9·8	12·2	11·8
Czechoslovakia	14·7	17·1	17·0	17·5	16·2	17·6	17·3	20·7
Denmark	28·7	28·5	28·9	30·3	—	—	—	—
Esthonia	9·0	10·3	11·7	10·8	—	—	—	—
France	13·8	14·8	15·5	15·5	10·5	12·5	15·0	15·8
Holland	27·5	30·2	29·7	29·6	—	—	—	—
Yugoslavia	9·1	11·8	10·5	11·9	13·5	14·4	16·1	17·1
Poland	10·6	12·3	11·7	11·9	10·6	10·0	9·0	12·8
Latvia	9·6	11·1	14·1	12·4	—	—	—	—
Hungary	10·4	13·4	12·8	14·3	13·4	16·0	16·5	20·2
Great Britain	21·8	22·6	22·6	22·5	—	—	—	—
Germany	17·4	19·8	21·5	23·3	—	—	—	—
Romania	8·5	9·2	9·0	10·2	10·7	10·6	10·9	10·1
Switzerland	20·2	22·0	21·0	22·9	29·2	28·1	30·0	29·1
Soviet Union	6·1	7·5	7·2	9·3	10·2	10·7	10·2	11·5
America								
United States	9·5	9·6	9·1	8·7	17·8	17·3	13·7	15·1
Canada	10·6	12·6	9·1	6·9	28·4	23·3	24·5	24·9
Argentina	8·4	10·1	9·3	9·7	16·8	19·7	19·3	17·1
Australia	9·2	7·2	8·2	8·2	16·5	16·5	16·1	14·3
Africa								
Algeria	4·5	5·5	5·6	5·3	7·2	6·6	7·5	6·1
French Morocco	6·4	6·8	6·9	4·0	5·3	6·4	4·6	4·6
Tunesia	3·2	4·6	4·4	5·1	2·9	2·6	3·3	2·6
Asia								
British India	7·9	6·8	7·4	7·3	—	—	8·7	8·7

large overseas exporting countries rather than of the increasing yields of the neighbouring or nearby Eastern European and Balkan exporting countries. This might be explained by the trend of prime costs. In the neighbouring exporting countries prime costs were far below those of Hungary which rendered undisturbed production possible, since the fall in export prices did not mean the same catastrophe for them as it did for agriculture in Hungary.

For the agriculture of these countries, the new period beginning at the end of the First World War did not entail any qualitative change. They produced – even earlier – primarily for export, because their internal markets were limited and their industry undeveloped. Their export markets constantly widened, and they

had to cope with the protective tariffs of developed industrial countries and competition on the world market both before and after the First World War. Their production level remained, accordingly, low and their production methods extensive. The higher yields of Hungary compared to other Eastern-European countries were partly the very consequences of the industrial development taking place in the Austro-Hungarian Monarchy between 1848 and 1914. These yields were, in the first place, the results of the advantageous position that Hungarian agriculture enjoyed on the *market of the Monarchy* before 1918, and were achieved, in fact, under the shadow and with the assistance of the high rate of Austrian and Bohemian industrial progress. These yields were consequences of the protective tariff that provided shelter from the competition of the Balkan countries.

Agriculture in Hungary was more developed and more intensive than in the neighbouring Eastern European countries. The prime cost was accordingly higher. The living standard of the rural population was higher too. However, the moment the Monarchy collapsed, and its single market disintegrated, Hungarian agriculture got into the same economic situation the surrounding Eastern European countries had even earlier been in: its development was based on exports to a world market depressed in that period, and on the poor internal market. The earlier development of Hungarian agriculture, on the other hand, exceeded the possibilities in both respects. Up to the First World War the increased customs duties provided a monopolistic position for Hungary on the market of the Monarchy, but after the war, Hungary had to export to *customs abroad*, that is she suffered from the disadvantages of protective tariffs as her earlier privileged position ceased. On the world market, Hungary was not competitive, even when disregarding the unfavourable conditions caused by the economic crisis, due to the high production cost of agriculture. The internal market was extremely limited for agriculture. The industry of the country was not sufficiently developed to promote the development of agriculture. On the contrary: the development level of agriculture surpassed the economic conditions of the country. This situation could obviously have but one consequence: the stagnation of agricultural production. This explains the peculiar situation of Hungarian agriculture in the inter-war period.

Notes

1) For grain surplus trends see: Országos Mezőgazdasági Kamara jelentése az 1935. évre (Report of the National Chamber of Agriculture for 1935) (henceforward: OMK), Budapest, 1936. 110. For the wheat surpluses of overseas countries see further: OMK. 1930. 134. and M. Szarka: A gabonatermelés alakulása 1920 óta általában és Magyarországon (Trends of grain production after 1920 in general and in Hungary). Budapest, 1930. 6. A világ búzatermelése és külkereskedelmi mérlege (World production and foreign trade balance of wheat). Budapest, 1935. 5. For this and for all further problems of wheat production see: S. Milhoffer: A magyar búza ára és értékesítése (Price and marketing of Hungarian wheat). Budapest, n. d. 106–114. J. Horti: A jelenlegi mezőgazdasági válság magyar nézőpontból 1920-tól napjainkig (Hungarian aspects of the

present crisis of agriculture from 1920 to the present day). Budapest, 1931. K. Rege: A magyar búza áralakulása és termelési költsége 1920-tól 1930-ig (Price trends and production costs of Hungarian wheat from 1920 to 1930). Budapest, 1931, see further: "Az 1929–1933. évi világgazdasági válság hatása Magyarországon" (Effects of the economic world crisis of 1929–1933 in Hungary) (ed. M. Incze) Budapest, 1955 (henceforward: Incze), and M. Szuhay: Az állami beavatkozás és a magyar mezőgazdaság az 1930-as években (State interference and Hungarian agriculture in the 1930s). Budapest, 1962.

(2) The data were collected from the corresponding volumes of Magyar Statisztikai Évkönyvek (Hungarian Statistical Year-books) and Annuaire Internationale de Statistique Agricole (Rome). See further: OMK 1930. 135. For the Danubian states see OMK 1930. 137. Szarka: op. cit. 8–9.

(3) Data of the Annuaire Internationale de Statistique Agricole (Rome) and Szuhay: op. cit. 12–18. For beet- and cane sugar production see: OMK 1930. 181–182 and OMK 1929. 111, and "Földművelésügyi igazgatás. Fejlődése, jelentősége, mai állása" (Agricultural administration; its development, importance and present state). Ed.: I. Máté (henceforward: Máté). Budapest, 1936. 37.

(4) For example in the United States the consumption of rye decreased by 8 per cent, that of barley by 10 per cent; in Argentina the consumption of maize decreased by 85 per cent (!) with a parallel 75 per cent increase of production, etc. See: OMK 1930. 138. Mezőgazdasági Közlöny (Agricultural Bulletin). 1936. 16. See further: S. Milhoffer: A világgazdasági válság mezőgazdasági árpolitikája (Agricultural price policy of the economic world crisis). Budapest, 1937. 82–85, and the works cited in note 1. For the whole process see: "A magyar mezőgazdaság és a békekötés (Hungarian agriculture and the peace-treaty). Budapest, 1946. 23–31. The trend of surpluses was influenced by the establishment of the grain-pool too, but it did not change the fact: the increase of stocks. Under the pressure the Pool ultimately collapsed. For this see: OMK 1930. 105.

(5) Economic consequences of the First World War. Budapest, 1943. 73. Special edition No. 24 of the Magyar Gazdaságkutató Intézet (Hungarian Research Institute of Economics). For the surpluses of the thirties see: OMK 1935. 110.

(6) Idem. For developments in Austria see: E. Lagler: Entwicklungsphasen der österreichischen Agrarpolitik zwischen den beiden Weltkriegen. In: Wirtschaftliche Entwicklung und soziale Ordnung. Wien, 1952. 395–418. Further literary data are found in: S. Frauendorfer: Quellen zur österreichischen Agrargeschichte der letzten hundert Jahre. Das Schrifttum der Agrarwirtschaft. 1938. 3. 49–57.

(7) There is no room for a full presentation of the extremely complicated calculations, and they are built anyway on very unstable foundations. There is no doubt, however, about the tendency. For a considerable part of the calculations see: Milhoffer: A világgazdasági válság mezőgazdasági politikája (Agricultural policy of the economic world crisis). Budapest, 1937. 220–222. Idem. A magyar búza ára és értékesítése (Price and marketing of Hungarian wheat). Budapest, n. d. 134–137, as well as National Archives, Archives of the Ministry of Foreign Affairs, Agricultural material of the peace preparation (henceforward: Preparation of peace).

(8) Data are based on corresponding volumes of the Annuaire Internationale de Statistique Agricole (Rome).

Part II

Chapter 3

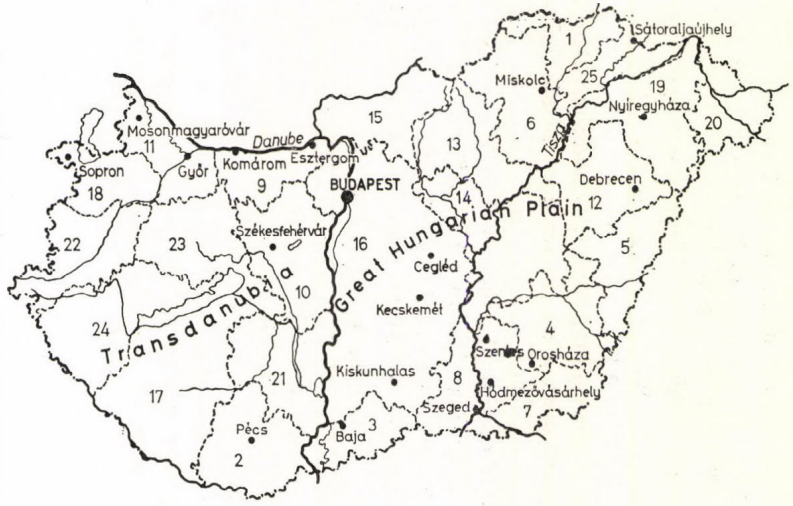
Agriculture on the new territory of Hungary before 1918

When on 4 June 1920 the representative of the Hungarian government signed the peace-treaty at Trianon, he only confirmed the unalterable fact: the disintegration of the Austro-Hungarian Monarchy, and the separation of areas mostly inhabited by nationalities. This contract put an end to many decades of political oppositions, and broke up, at the same time, the economic relations which had become increasingly complex in the course of centuries.

There was no doubt that the economy of the new Hungary was influenced – even if not equally – by all factors of this double process. Definitely this situation entailed an assessment and consideration of fundamental economic changes and adaptation to them if the nation were to survive. It was much more the case than even the contemporaries believed it to be. The independent state of Hungary with its reduced territory had to face more complex conditions than any of the so-called "successor states" established on the territory of the former empire. The severity of these economic problems is indicated also by the fact that many of them have not been solved even to the present day(1).

The overall character of changes is shown by the fact that the 92 607 km^2 area of the new territory of Hungary was 32·7 per cent of the old one, and when the results of the 1910 census are related to this area, 7·6 million people – i.e. 41·6 per cent of the 1910 number – were living on it(2). These two data sum up almost all the problems raised by the change of area: it was the central regions of the country, where population density was much higher, that were left to Hungary. The density of population(3) was 82·4 compared to the former 64·2 per km^2. This number grew to 97·8 by the end of the thirties, and to 100·1 by 1941, exceeding thus the population density of most developed industrial countries, e.g. the contemporary United States of America, France, Austria, Denmark or Sweden, not to mention the industrially less developed agrarian countries, moreover it almost reached, and in the 1930s doubled the average density of populations in contemporary Europe. And to look at the situation from another point of view: while the proportion of agricultural production within the new frontiers was lower, the number of farming populations per unit cultivated area was relatively higher. The number of the farming population (and dependants) per 100 cad. yoke (1 cad. yoke = = 0·57 ha) of the cultivated area was 24 on the old and 28 on the new territory of Hungary, that is, the area providing living for the agricultural population was considerably reduced. With only the areas of arables, gardens, vineyards and meadows considered, this ratio shows a decrease (farming population and dependants per 100 cad. yoke numbered 41 on the old and 37 on the new territory of

Hungary after World War I.



1. Abauj-Torna county
2. Baranya county
3. Bács-Bodrog county
4. Békés county
5. Bihar county
6. Borsod-Gömör-Kishont county
7. Csanád-Arad-Torontál county
8. Csongrád county
9. Esztergom-Komárom county
10. Fejér county
11. Győr-Moson-Pozsony county
12. Hajdu county
13. Heves county
14. Jász-Nagykun-Szolnok county
15. Nógrád-Hont county
16. Pest-Pilis-Solt-Kiskun county
17. Somogy county
18. Sopron county
19. Szabolcs-Ung county
20. Szatmár-Bereg-Ugocsa county
21. Tolna county
22. Vas county
23. Veszprém county
24. Zala county
25. Zemplén county

Hungary), but even this could not improve employment as it offered only one kind of job. Hence the basic problem: on the present territory of Hungary the economy of an undeveloped agrarian-industrial country had to ensure living for a population with a density characteristic of a developed industrial country.

This dilemma could be solved in two ways: either by dividing the large estates which would provide a living for vast numbers of landless agricultural labourers, which would at the same time have considerably increased the inner market for industry as well, or by developing the industry – artificially, through government subsidies too – and thus attempting to absorb the increasing numbers of those looking for employment. Under the given political conditions, when after the failure of the 1918–19 revolutions a reactionary stratum conservative to the core, came into power, any serious form of the first solution could not even be imagined. Industrial development, on the other hand, encountered enormous difficulties. True, regions at a higher level of industrialization fell within the new frontiers – as indicated by the fact that while before the war 64·5 per cent of the population was engaged in agricultural work(4) –, on the new territory of Hungary they made up only 55·8 per cent but the overwhelming part of raw material resources remained outside them. That is to say: besides supplying the population with food at an increased level, since the proportion of the agricultural population was much lower here, agriculture had to cover henceforward the import of raw materials, the basis of industrial development; and to do it at a time when parallel with the higher prices of industrial raw material relatively low export prices of agricultural produce could be attained. We have to mention further that the consequences of industrial development, the new tariff system introduced for the protection of industry, and the resulting high industrial prices put agriculture in a difficult position compared to its former situation. The high industrial tariffs resulted in high internal prices too, which again demanded increased efforts from agriculture. Thus the situation became in fact, reversed: while before 1918 agriculture enjoyed the protection of high tariffs and industry had to put up with all its disadvantages, on the new territory of Hungary it was industry that enjoyed the advantages of customs protection and agriculture that had to cope with the competition of the world market. Under such conditions the importance of agriculture for the whole national economy rapidly increased. What was thus the structure of agriculture like on the new territory of Hungary? *What was the difference in the structure of agriculture between the new territory and the total area of Hungary before 1918?* This question must be answered in detail, since the development processes described in the previous chapter did not show the same intensity on the entire area of the country. It follows, in turn, that with the new frontiers drawn, new proportions and a new structure of agriculture, different from those existing earlier in Hungary were obviously fixed within the new frontiers. Naturally, the specific conditions of this area had earlier been concealed among the data related to Hungary. Now we have to sort them out in order to be able to understand one of the decisive factors influencing further development.

If we have a look at the topography of the new territory of Hungary we mostly

find lowlands or hilly regions with medium high mountains here and there, that is, conditions favourable for agriculture. Unfavourable factors are, on the other hand, the generally known extreme weather conditions (the advantage of a growth season somewhat longer than the Central European average is offset by the relatively low annual precipitation of 600 mm or so, which, in addition, is not evenly distributed; summer drought especially disadvantageous for root and roughage crops frequently occurs), and the quality of the soil itself. As for the latter it is enough to consider that besides a highly diversified composition of soil which has the characteristic feature of almost all types of soil, from heavier clay and alkali soils to loosé drift sand, often encountered in the district of a village, the proportion of poor quality lands is very high. Out of the cultivation area of the new territory of Hungary a round 900 000 cad. yoke was alkaline (of which 600 000 cad. yoke could be ameliorated), 3 200 000 cad. yoke sand, and the acreage of acid soils poor in lime was estimated to be 4–5 000 000 cad. yoke. Thus, a disproportionately large part of the poor soils requiring an expensive work of amelioration fell within the new borders, in other words, with prime cost being higher, agricultural production here was substantially more expensive. This could only have been compensated for if good market possibilities had been available. As we shall see this was not the case, so the higher prime cost had an adverse effect on the whole of agricultural production(5).

That in spite of these soil conditions the average yield of most crops was higher in the present area of the country was the result of essentially higher inputs. While on the borders of the old territory of Hungary farming was much more extensive than in the central regions, i.e. on the present area of the country, the higher prime cost on the latter was returned at the relatively high agricultural price level existing on the markets of the Monarchy. This explains the surprising fact that on these relatively poor lands the average yields of cereals and root crops were somewhat higher than on the border areas.

The relatively high yields in inner regions (the present Hungary) could be attained by increased inputs, especially with larger amounts of fertilizer applied. The number of animals per km² was higher here; in 1911 22·5 cattle, 7·2 horses, 26·3 sheep and 23·3 pigs per km² on the entire pre-war area of Hungary, and 123·6 cattle, 9·7 horses, 36·4 pigs and 26·4 sheep per km² on the post-war territory of the country(6). But this was not by any means as much as to say that the number of animals per unit agricultural area too was higher on the new territory of the country. On the contrary, the amount of manure applied per unit area was lower.

The differences are reflected by the proportions of cultivation branches as well. On the present area of the country the inner ratios were even before 1918 quite different from those on the whole territory of Hungary at that time. With the enactment of the peace treaty these proportions assumed a new independent role (Table 12).

The table shows fundamental structural differences. The proportion of arables was considerably higher on the new territory of the country, which in itself was a favourable phenomenon. The substantially higher proportion of alkaline, sandy

	On the territory of Hungary	
	before 1918	after 1918
Arable	45·5	60·3
Garden	1·4	1·1
Meadow	9·3	7·2
Vineyard	1·1	2·4
Pasture	11·7	11·1
Forest	25·8	11·4
Reeds	0·1	0·3
Uncultivated	5·1	6·2
	100·0	*100·0*

Table 12. Distribution of the total cultivation area in per cent; on the average of 1911–1915(7)

and acid soils – naturally – increased here the prime cost of production. In theory the larger vine growing area was also advantageous. However, the yield of the increased vine growing region was put on the domestic markets with greater difficulties than earlier. This involved an enormous overproduction, then – in the second half of the thirties – resulted in a considerable reduction of the vine growing regions.

The ratio of grasslands (meadow and pasture) was essentially lower on the present territory, suggesting that the earlier described process of ploughing up meadows and pastures and introducing intensive forms of livestock breeding before the First World War took place mainly on the present area of the country. In the case of meadows there was a great numerical difference too, while with the pastures the decrease was even worsened by the fact that due to the soil and climatic conditions pastures left on the new territory of the country were of poor quality. As for the change in the ratio of grassland to arable: meadows and pastures made 42·6 per cent of the arable area on the old, and only 30·3 per cent on the new territory of Hungary before the First World War(8). In addition, the poor quality of grasslands involved – beyond the numerical values – a further considerable decrease in the natural fodder areas.

As a consequence, a greater stress was laid on fodder growing required for the maintenance of livestock, and thereby the prime cost of livestock husbandry was higher on the new territory of the country. On this area livestock husbandry was more intensive, stabled management wider spread, and the maintenance of livestock depended to a greater extent on fodder growing. Of course this yielded positive results in the utilization of arables by increasing the labour intensive growing of fodder crops having largely an ameliorative effect compared to the extensive cereal growing. It increased, however, the production costs of livestock breeding too, which in the case of good market conditions and favourable possibilities of disposal would not have been disadvantageous, but in the inter-war period caused serious difficulties in livestock breeding. Of these opposed tendencies the latter became predominant leading to a decrease in the cattle stock. Moreover its density per unit area compared to earlier conditions declined also, which in turn was unfavourable for crop growing (shortage in manure).

Owing to the low acreage of forest areas on the new territory of the country

the internal production was unable to ensure the timber requirement of Hungary. The large volume of import caused a great increase in the price of timber, and this was perhaps one of the main reasons why inhabitants of the Great Hungarian Plain continued to use manure and straw for fuel considerably decreasing thereby the manure production – much lower anyway than the national average – on these areas.

On the new territory of the country the proportion of lands under intensive cultivation was higher than earlier (this was, in fact, due to the higher proportion of arables). The considerably larger proportion of uncultivated areas only partly seems to be disadvantageous. Namely, it reflects, at the same time, the intensification of production too, since in the higher ratios an important role is played by the fact that in the inner regions of the country, on the new territory of Hungary, the network of roads was even before 1918 much denser than in other parts of the former territory of the country.

Let us have a closer look at the columns of Table 12. To begin with the most important component, the arable area: What differences in the utilization of arables were fixed by the new frontiers? In what way did the structure of the arables within the new territory of the country differ from that existing in Hungary before 1918?

The differences were manifold. The ratio of cereal growing, and thereby of extensively cultivated areas, was undoubtedly somewhat lower within the total area of arables. The areas sown to wheat, rye, barley and oat made up 57·1 per cent of the arable area on the old, and 55·4 per cent on the present territory of Hungary, which in itself was favourable for the new area. At the same time, the sowing area for bread grains was larger here: on the old territory of Hungary it was 38·3, and after 1918, 39·7 per cent of the arable area.

Under such conditions the need for replacing the one-sided grain cultivation by more intensive crops became even more urgent, especially so as the joint proportion of root crops, maize and potato areas was lower on the new territory of the country. The lower acreage of maize had a specially adverse effect after the new borders had been drawn, since a large proportion of the pig stock fell within the new frontiers, and maize production on the new territory of Hungary had – even in years of medium yield – difficulty in supplying this relatively higher density stock with feed.

Another feature of the basic differences is connected with this group of problems: the significantly higher proportion of fodder growing on the new territory of Hungary; it was extremely important, since livestock could only be maintained by this. And it meant at the same time that after the new borders had been drawn the intensification of field production was urged not only by the relatively higher population density of these regions but also by difficulties in maintaining the livestock. As a matter of fact, the more intensive character of the arable area was rather a problem of marketing, so its maintenance on the new territory of the country under the new economic conditions mostly depended on trends of the world market.

On the present area of the country the average yield of arables was somewhat higher, due to the more intensified cultivation. In those regions, which after 1918 fell within the new frontiers, yield averages were slightly better even before the First World War. This was on account of a better tillage of the land, higher level of agriculture characterizing the inner, central regions of Hungary, that is, the new territory of the country. In these regions soil conservation before 1918 was of higher degree than in other parts of Hungary. As for manure supply, the situation was less favourable; the amount of farmyard manure utilized per 100 cad. yoke was 30·3 q on the old, and 24·9 q on the present territory of the country, and with the areas of arables, gardens, meadows and vineyards jointly considered this figure was 25·0 q for the total pre-war area, and only 21·2 q for the present area of Hungary(9). And if the yield averages were still higher here, it was due to a higher rate fertilization. The higher input was covered by increased prices (the raise of tariffs in 1906 should be kept in mind). These favourable price conditions, however, discontinued after 1918. So with less manure there was a decline or at least stagnation to be expected in the yield averages.

To make an assessment of our investigations we must concentrate on the two most important produces: bread grains and fodder crops. With normal conditions of cultivation taken into consideration some 7–8 million q surplus wheat and rye could be reckoned with a year. As for the fodder crops, the situation was unfavourable. On the new territory of the country a shortage of about 2·8–3·5 million q had to be reckoned with, which could only have been compensated for by increasing the fodder crop area or a greater utilization of bread grains in feeding, if regular imports were to be avoided.

The structural changes occurring in livestock husbandry, the other large branch of agriculture, were similarly important. The last registration of animals before the First World War, carried out by the Central Statistical Office, took place in 1911. When relating its data (see Table 13) to the present area of the country we obtain a true picture of what the difference in the inner structure of livestock was between the old and the new territory of Hungary.

According to statistical data, of the total livestock 34·75 per cent of the cattle stock, 44·77 per cent of horses, 51·77 per cent of pigs, 31·25 per cent of the sheep stock, 40 per cent of asses, 22·22 per cent of mules and 6·34 per cent of goats fell within the new frontiers of the country. Thus, with the new frontiers drawn essential differences were fixed in the structure of the livestock too in comparison with the conditions of pre-war Hungary. In other words: on the new territory of the country the structure of livestock was even before the First World War essentially different from that on the total pre-war area of Hungary.

Even if this difference was not too important concerning the whole of the livestock, as for the ratio between the individual animal species, that is the composition of the livestock, it was all the more significant. Let us see the trends of animal density relative to 100 cad. yoke of arables, meadows and pastures. On the total area of Hungary before 1918 the number of animals per 100 cad. yoke of the area considered was: 18·7 of cattle, 6·1 of horses, 19·7 of pigs, 23·6 of sheep, and with

Table 13. Livestock of Hungary in 1911(10)

	On the old territory of Hungary		On the present area of Hungary	
	1000 animals	%	1000 animals	%
Cattle	6 184	100·0	2 149	100·0
grey Hungarian breed	1 873	30·4	648	30·1
red-spotted breed	3 591	58·0	1 328	61·8
badger-coloured	172	2·8	30	1·4
other breed	393	6·3	132	6·1
Buffalo	155	2·5	12	0·6
Horse	2 001	100·0	896	100·0
Pig	6 416	100·0	3 322	100·0
lard-type	5 468	85·2	3 070	91·3
meat-type	949	14·8	252	8·7
Sheep	7 698	100·0	2 406	100·0
merino	2 459	31·9	1 691	70·3
racka and cigája	4 569	59·4	469	19·5
meat-type	670	8·7	245	10·2
Ass	20	100·0	8	100·0
Mule	1·8	100·0	0·4	100·0
Goat	331	100·0	21	100·0

the total livestock taken into account 30·5 standard animals. On the present area of the country, 15 cattle, 7·2 horses, 27·7 pigs, 19·3 sheep and—with the total livestock considered again—29·4 of standard animals fell to 100 cad. yoke. The density of animals was not thus essentially lower. A fundamental change occurred, however, in the structure of the livestock. Namely, as we saw, the animal species were not equally affected by the new frontiers. The above data too call attention to the fact that it was in the first place the density of cattle and sheep—that is of animals requiring the largest grazing areas and producing, at the same time, the highest volume of manure—that became considerably lower. Differences in the structure of livestock are even more obvious when we examine the percentage proportions of each of the four main animal species expressed in standard animals.

The differences between the inner proportions suggest important correlations. Here we only refer to the considerably lower proportion of cattle and much higher proportion of pigs within the total livestock. That the mentioned index of animal density is not realistic is shown by the phenomena appearing as a consequence of the structural changes, which suggest great deficiencies in manure production.

	Cattle	Horse	Pig	Sheep
On the old territory of Hungary	60·4	19·6	12·5	7·5
On the present area of Hungary	51·0	24·4	18·1	6·5

Table 14. Percentage proportions of animals expressed in cattle unit in 1911

Manure production, very low, anyway, in Hungary, was even lower on the present area of the country. While the amount of farmyard manure utilized per cad. yoke of arable on the pre-1918 area of Hungary was 30·3 q, it was only 24·9 q on the present area of the country before the First World War. This series of data reflects too that the increased number of the pig stock could not make up for the decrease in the cattle and sheep stock. In addition, these data too are only valid in theory, and show but the maximum, since the relatively extensive livestock raising, draught animals often maintained on the pasture, as well as poor feeding and improper manure handling – all considerably decreased the quantity and quality of manure. Differences in the structure of livestock had a certain impact on the process of intensification as well, as shown by the ratios of arables and livestock: the acreage of arables per standard animal was 2·9 cad. yoke on the old, and 3·9 cad. yoke on the present area of the country.

How could livestock with its significantly changed structure be integrated with the whole of agriculture? Knowing the proportions of the utilizable land areas we can pay more attention to these questions already touched upon. As we have mentioned, the earlier ratio of livestock and fodder crop areas was quite different on the new area of the country, and the feed requirements were supplemented with fodder crops grown in the field and maize from the border areas. These conditions could not be taken into consideration when the new frontiers were drawn.

Beside the data already mentioned, which show how the earlier balance was upset, let us present some of them referring to correlations primarily important from the point of view of the livestock. As we saw, the proportion of meadows and pastures was rather low with respect to the arable area, and very unfavourable compared to the number of livestock left. If we express the number of cattle, horse and sheep (these are the animals of high grazing demand) in standard animals, the acreage of meadow and pasture per standard animal was 0·51 and 0·64 cad. yoke, respectively, on the old, and only 0·38 and 0·58 cad. yoke, respectively, on the present area of the country, even before 1918. These figures too show that, although both grassland areas were smaller on the present area of Hungary, the difference was not of the same extent. The proportion of meadows was much lower than that of pastures. And since farm conditions within the livestock branch are of special importance we note here that the proportion of natural grasslands in peasant farms (below 100 cad. yoke) was much lower than even the average (the difference here was 21·8 instead of 19·6 per cent)(11)! Besides, there was an enormous difference in forest grazing areas too, which on the total pre-1918 area of Hungary were an important factor, but on the new area of the country were only found on the northern parts. In addition, the quality of meadows and pastures was considerably poorer on the new area of the country. There were areas here expressedly bad for fodder growing and pasture management, with unfavourable climatic and soil conditions.

The present area of the country required thus – even before 1918 – an urgent improvement in fodder crop production. Let us see now the relation of fodder production and livestock structure. The new frontiers had no uniform effect in

this respect, we may even speak of decidedly opposite tendencies. Namely, when examining the sowing area of fodder crops we obtain highly negative results. With the joint acreage of maize, barley and oats per cattle unit of the livestock considered, the situation here seems quite favourable, since the new proportions – even if not covering – lessened the shortage resulting from the decrease in pasture and meadow areas. Of the above area 0·79 cad. yoke fell to one cattle unit on the old territory of Hungary, and 0·82 cad.yoke on the post-war area of the country. The picture shown by a more detailed analysis is, however, less favourable than that. As we have seen, 32 per cent of the area of oats was left within the new frontiers, while of the horse stock 44·47 per cent. In the case of maize areas the situation possibly was even more disadvantageous, as of these areas 35 per cent was left, while of the stock of pigs fattened on them 51·77 per cent; and if we add that in the Carpathian Basin maize was used to feed horses too, the unfavourable tendencies are even more accentuated. The proportion of barley areas improved the situation to some extent, since 47 per cent was left of them. When considering all this together, we can clearly see the problems arising in the feasible maintenance and development of the livestock owing to the disproportions of grain fodder areas, which earlier were offset by purchasing the fodder grain requirements from other parts of the country, lost after 1918. In the case of a slightly poorer maize yield considerable volumes of maize had to be imported (which in the case of better yields did not exclude the maize export).

The ratio between areas of beet and roughage crops as well as the livestock showed a far better trend than the above. Of the sugar beet area 42·3 per cent while of the area of fodder beet 63 per cent remained within the borders of the country. The by-products of sugar beet processing served mainly to feed the cattle stock and – since only 34·75 per cent of the cattle stock remained in the new territory of Hungary – this made up for the decrease of grass fodder areas. However, pig rearing gained nothing by this, so this branch suffered from the low proportion of potato areas, as only 39·2 per cent was left to Hungary after the war compared to 51·77 per cent of the pig stock. As regards cattle rearing, we must consider that besides the higher proportion of fodder beet areas (as seen above, it was almost twice the percentage proportion of the cattle stock), the much larger share of maize areas in the total arable area was not unfavourable either. Since the maize areas and cattle stock were almost similar, maize stalks were utilized as feed for cattle. (This was why feeding with maize stalks to a harmful extent was preferred in the inter war period.) The situation was the most favourable with roughage crops; alfalfa 56·5, clover 37·2 and vetch 58·8 per cent of the average sowing area were left to the new territory of Hungary. If we add the area of fodder beet, of basic importance in cattle rearing (of which 63 per cent remained within the new frontiers) and take into account that about 37 per cent of the joint number of cattle and horse remained here, we can see that these two main species of livestock could only be maintained by the growing of fodder crops.

The composition of feed reserves (and partly the break of earlier established relations with the disannexed parts of the country) have made their effects felt

even to the present day in the position of livestock husbandry and in the trend of the number and quality of livestock. On account of the market conditions getting worse, the livestock as a whole never reached the level of 1911 between 1920 and 1938. The level of 1911 sometimes was approached by the pig stock, but even that only after one- or two-year periods of better maize yields, and when maize yields were reduced to the average level, the number of pigs dropped at once. No doubt, the whole of livestock husbandry was more intensive on the new area of the country than on the total pre-war territory of Hungary. But this more intensive livestock husbandry lost its former basis – a buyer's market paying good prices – after 1918, and this meant that further increases in livestock density, higher productivity could not be ensured. It would nevertheless have been necessary, since livestock density relative to the population number was lower on the present area than on the old total area of Hungary even before 1918 (although – as seen before – even there it decreased at the turn of the century). On the old territory of Hungary before 1918 the number of standard animals per 100 head of the population was 57·6 (35·0 of cattle, 11·8 of horses, 36·3 of pigs, 40·9 of sheep), while on the present area of the country only 52 (28·3 of cattle, 11·8 of horses, 43·7 of pigs, 31·6 of sheep)(12), that is, livestock husbandry had to attain high results here if the economic requirements and the demand of the population on the new area of the country were to be fulfilled.

We can take a further step in studying the structural changes in the livestock. From the data the differences between the inner structures of the different animal species can be analysed as well as their effects on agriculture as a whole. The question of breed is the first to be closely examined.

Table 14 shows the differences in the proportion of breeds between the present and the old territory of Hungary in 1911. In cattle the higher percentage (61·8 compared to 58 per cent) of the red-spotted breed which improved the quality of the whole stock to a great extent, was by all means a favourable feature. As seen in the series of data, the share of the grey Hungarian breed – which even then was strikingly large – remained almost unchanged (30·1 instead of 30·4 per cent), which may have been connected to the fact that oxen used for draught work on a large part of the country were exclusively of Hungarian breed at that time, so the more intensive red-spotted breed demanding increased care was introduced at the expense of partly the badger-coloured breed (which decreased from 2·8 to 1·4 per cent), but mainly of the buffalo stock (falling from 2·5 to 0·6 per cent). To lose grey Hungarian cattle with Transylvania, badger coloured cattle with Sub-Carpathia and the buffalo stock found in considerable numbers on the border areas was only a minimum loss for the undoubtedly more modern composition of livestock. The possibilities of breeding were far more limited by the breaking up of the traditional relations established in the Carpathian Basin during the previous centuries which ought to have been rapidly restored. So the breeding relations with Transylvania rearing traditionally draught oxen, and with some other peripheral regions broke off, and new areas within the new frontiers had to start breeding draught oxen. Sugar factories and distilleries on the present area of

the country too had earlier purchased cattle for mass fattening from these areas. The milking dairies around the capital suffered a similar shock; from then on they could only satisfy their requirements for cows from Transdanubia instead of the earlier regions. This disruption of the traditional production relations could be compensated for in a relatively short time without much trouble.

Similarly favourable qualitative ratios are shown on the present area by the sheep stock. The coarse- and mixed-wooled stock (racka, cigája) almost completely disappeared from the present area of the country even before 1918, and the sudden increase of the fine-wooled stock (70·3 instead of 31·9 per cent!) fundamentally changed here the composition of the sheep stock. Thus the foundations of a higher level of breeding in the remaining country regions had been lain before 1918. Though the milking sheep farms had remained outside the present borders, later they were partly substituted by a merino stock. The dominance of the merino breed within the stock had an extremely favourable influence on the types developing on the present area of the country even after 1918.

However, no similar positive trends can be detected as regards the pig stock. On the contrary, the 8·7 per cent share of meat-type pigs on the present area of the country compared to 14·8 per cent on the old territory of Hungary suggests the poor quality of the stock at that time. The relatively high proportion of mangalica, a lard-type pig, in the livestock of the new country area at a time when a quite different tendency of consumption was evolving, when the market demands were slowly changing and giving preference to the meat-type pig, was not favourable. The breeding of meat-type pigs had earlier been carried on mainly outside the new frontiers, on account of which meat industry suffered a lot after 1918. These unfavourable qualitative changes were accompanied by a few, almost insignificant further disadvantages. Namely, in pig breeding the production relations between the areas left and those disannexed were not of the same extent and importance as in the cattle branch. Although with Bihar and Szatmár counties well functioning mangalica farms were lost, which had earlier supplied the inner regions with piglets and young porkers, this loss was relatively easy to make up.

Changes in the breeds of horses cannot be analysed as the survey of 1911 did not, unfortunately, record them. Some sort of shift within the stock obviously took place here too, if we consider the loss of the mountain "hucul" horses and of the Belgian draught-horse stock in Muraköz, which was a greater loss.

Besides qualitative differences originating from the breed character we must take other questions of the structural differences of livestock into consideration too. The registration of animals in 1911 makes it possible to examine the sex and age composition as well as utilization of the livestock (Table 15).

Investigations into the age and sex composition of the livestock reveal considerable differences. In fact, such deviations as suggesting fundamentally different methods of breeding cannot be found, since the present area of the country did not display any specific feature of livestock husbandry compared to other parts of Hungary, although the reduced proportion of ewes was almost catastrophic. This was, however, a single case, no similar structural differences in the whole

Table 15. Distribution by sex and age of the livestock of Hungary in 1911 on the old and new territory of the country(13)

	Total livestock of Hungary in 1911		Livestock of the present area of Hungary in 1911	
	1000 animals	%	1000 animals	%
Cattle				
sucking calf	404	6·5	104	4·9
young cattle	1 894	30·6	218	33·4
fully grown cattle	3 886	62·9	1 327	61·7
bull	166	2·7	73	3·4
heifer	1 065	17·3	397	18·1
cow	2 667	43·1	878	40·7
steer	709	11·5	269	12·0
ox	1 172	18·9	429	20·0
Horse				
fully grown	1 584	79·16	681	76·0
foal	417	20·34	216	24·0
colt	135		67	
stallion	144		72	
filly	204		105	
mare (breeding and draught)	928	46·0	453	48·7
total mare	1 123		546	
gelded foal	79		41	
gelded draught-horse	655		243	
total gelded horses	734		284	
Pig				
piglet	3 019	47·0	1 603	48·2
young porker	1 737	27·1	913	27·5
fully developed (boar for service and porker)	1 660	25·9	807	24·3
boar for service	58	0·9	29	0·9
brood-sow	1 192	18·6	556	16·7
porker	411	6·4	222	6·7
Sheep				
lamb	1 580	20·5	523	21·7
wether and yearling	1 146	14·9	632	26·3
ram for service	195	2·5	53	2·2
ewe	4 738	61·6	1 171	48·7
fatted sheep	39	0·5	26	1·1
milked sheep	3 309	69·9	480	41·0

livestock were encountered. Yet, variations did occur in the structure, and not for that matter to a small extent. On the present area of the country e.g. the higher than average proportion of young cattle within the total cattle stock (33·4 instead of 30·6 per cent), and parallel to it the significantly smaller cow stock (40·7 instead of 43·1 per cent) was conspicuous; after this area had been separated from the other parts of the country, it had an adverse effect not only on the perspectives

of breeding and milk production but also on the possibilities of field cultivation (draught power). The decreased percentage of cows is easy to understand: regions with a relatively higher acreage of grazing lands have larger cow stocks. Stabled cows were of higher quality on the present area of Hungary. The percentage of oxen within the total livestock was somewhat higher here. Its consequences on the draught power requirement will be discussed later.

In the structure of the horse stock a perfectly clear cut tendency is found. The centre of foal rearing was always on the present area of the country, so the percentage of foals and mares within the total horse stock was, quite naturally, higher here than the average of the old territory of Hungary (24 and 48·7 per cent instead of 20·8 and 46 per cent, respectively). The decreased proportion of gelded horses in comparison with the old territory of the country was not disadvantageous to the draught stock because – after all – almost all horses were for use.

The inner ratios of the pig stock were not exempted from the consequences of the new frontiers either. As seen before, a relatively larger part of the stock remained within the new borders. This stock – while denser – was inferior in quality, not only as regards breeds, but in its age and sex composition too. In comparison with the total area of historical Hungary the proportion of piglets and porklings was higher (48·2 and 27·5 per cent compared to 47·0 and 27·1 per cent, respectively), while that of adult animals and especially of sows, lower (24·3 and 16·7 per cent compared to 25·9 and 18·6 per cent, respectively) on the present area of the country, which – in fact – meant that a numerically larger stock could not compete with the total stock of the old territory of Hungary either in weight or in reproductive capacity. Thus, the higher number of the stock was only seemingly advantageous. It must be noted, though, that of all animal species discussed here the pig stock responded the quickest to external changes, so it could overcome the above mentioned difficulties much sooner than either cattle, horse or sheep.

As mentioned before, the most radical changes took place in the structure of the sheep stock. In the earlier process of breeding on the present area of Hungary, the much lower proportion of ewes (48·7 instead of 61·6 per cent) was the most unfavourable feature. The earlier mentioned improvement of breed was thus offset by such a decrease in the breeding stock as threatening the possibility of increasing the number of sheep. It must be taken into consideration that this area became independent losing thereby earlier production relations with the disannexed parts of the country. Later, when studying the numerical trends of the sheep stock, we shall see the adverse effects of this circumstance.

Remarkable conclusions can be drawn from the correlation of agricultural area and livestock too, as it gives a cross-section of farming. When discussing the question of livestock density we referred to the relation of total area and livestock. Table 16 summarizes these data completed by those on the number of animals per unit arable.

It is by comparison of the two series of data that the extent and tendencies of the structural differences are really seen. The table shows that even if the decrease of livestock on the present area was not quantitatively significant, from the point

of view of quality it was all the more so. Owing to the relatively greater importance of the arable area, the number of cattle per unit arable was – even before 1918 – much lower on the present area of the country than on the whole territory of Hungary of the time, which indicated that both farmyard manure and draught power required substantial completion. The number of sheep per unit arable was almost twice lower than that related to the total agricultural area. This unfavourable situation could not be compensated for by the increased proportion of either the horse or the pig stock. The difference between the old and new territory of Hungary in the number of horses was much lower when related to the arable than when to the total agricultural area. The pig stock on the present area of the country – though larger even when compared to the former – was undoubtedly larger per unit agricultural area than when only related to the arable area.

Even the above figures imply that owing to the larger proportion of arables on the present area of the country the draught stock was no longer enough for carrying out the most important operations. The cattle stock here was – even before the First World War – much less suitable and used for draught work than on the old territory (Table 17).

On the present area of Hungary half as many cows were used for draught work as on the old territory of the country; hardly any buffalo team was seen and the ratio of draught oxen too was somewhat lower. However, horses did not satisfy the growing requirements of ploughing, as suggested also by the data showing that the number of horses per unit arable on the present area of the country was but slightly higher than when related to the total agricultural area; the relative increase in the stock here did not keep pace with the much higher rate of growth in the acreage of arables. The interrelation of draught animals and arable area can be seen in Table 18.

Thus, in the work of ploughing it was not horses which replaced the draught animals which had been lost but tractors. These had been first introduced even

	Total agricultural area of Hungary		Arable area of Hungary	
	old	new	old	new
Cattle	18·7	15·0	27·8	22·4
Horse	6·1	7·2	9·0	9·4
Pig	19·7	27·7	28·8	34·7
Sheep	23·6	19·3	34·5	24·2
Cattle unit	30·5	29·4	45·9	41·4

Table 16. Livestock per 100 cad. yoke in 1911(14)

	Area of Hungary			
	old	%	new	%
	1000 animals			
Ox and steer	1 028	16·6	345	16·5
Draught buffalo	42	0·7	8	0·4
Draught cow	484	18·2	82	9·3

Table 17. Cattle used for draught work in 1911(15)

	Territory of Hungary	
	old	new
	Number of animals	
Fully grown horse	7·1	7·1
Draught ox and steer	4·6	3·6
Total draught animals	11·7	10·7

Table 18. Draught animals per 100 cad. yoke arable in 1911(16)

before 1918 on the present area of the country. This phenomenon too indicated that on the present area of Hungary agriculture was much more intensive than on the disannexed areas.

It was highly favourable for the whole economy of the present area of Hungary that the poultry stock, so important in foreign trade too, was not much lower relative to the number of inhabitants. Precise data cannot, unfortunately, be given here, as the poultry stock was not registered by the Central Statistical Office in 1911. The data collected in 1895, on the other hand, cannot be used in a study like this, because the poultry stock made an extremely rapid progress. Besides, the poultry stock is quick to respond to any change in the economic situation, so in the absence of data conclusions should not be drawn by a process of elimination. Nevertheless, two factors can be taken into consideration. First: districts supplying considerable surplus volumes even before the war were left to Hungary after the peace treaty. In fact, only some larger goose-farms along the rivers Ipoly, Garam, Nyitra, Vág and Danube were lost, the regions carrying on poultry breeding in large dimensions remained within the new borders. The other factor that confirms the conclusions drawn on the preceding pages is that several years following the end of the war fairly large volumes of poultry were exported already, suggesting that the proportion of poultry farming was highly favourable on the new territory of the country.

On the basis of our investigations it is possible to throw light upon the relation of agriculture and population number on the new area of Hungary, and on the new conditions created for agriculture by the above outlined structural difference. It is perhaps enough to compare the population number with the main parameters of agriculture (Table 19).

Thus, the supplying capacity of Hungary on the new area of the country was not, in fact, significantly higher, only of different proportion. Surpluses of bread

Table 19.(17)

	Agricultural area/100 head				Number of animals/100 head			
	Bread grain	Potato	Maize	Total	Cattle	Horse	Sheep	Pig
	cad. yoke							
On the old territory of Hungary	42	5·9	23	70·9	35·0	11·3	40·9	36·3
On the new area of Hungary	51	5·6	20	76·6	28·6	11·9	32·0	44·2

grain, flour and fat were larger, while the ratio of beef, milk, dairy products and wool was smaller.

Owing to the failure of the 1918–1919 revolutions the social structure of agriculture did not fundamentally change. The contrast between vast estates and landless peasants or dwarf holders continued to exist. The system of landed property remained unchanged, consequently farm conditions were not substantially modified either.

Before the First World War, Hungary – as generally known – was a country of latifundia. We only touch upon the question pointing out the following: according to the statistics on farms of 1895, 23·6 per cent of the farms were smaller than 1 cad. yoke, 30·0 per cent was 1–5 cad. yoke, 19·2 per cent 5–10 cad. yoke and 16·1 per cent 10–20 cad.yoke. Only 0·2 per cent was above 1000 cad.yoke, but these farms occupied 32·3 per cent (!) of the total area compared to 29·4 per cent owned by all the other farms mentioned before. These enormous disproportions alone indicate the extreme conditions of those times. When adding the completely landless strata of agricultural labourers to this, we get a full picture of agrarian society at that time.

The social structure of agriculture showed greater discrepancy on the present area of Hungary than on the historical territory of the country. Regions where peasantry had a larger share of the land were lost, and those displaying an overwhelming dominance of large estates remained within the new borders. While the ratio of peasants having arables of 10–50 and 50–100 cad. yoke, respectively, was higher on the new area of the country than that of the poorer layers of peasantry, and within this the arable area of farms of 10–50 cad. yoke was somewhat larger too, this did not alter the fact that the ratio of landed properties above 100 cad. yoke was here much higher and – what was even more unfavourable – the share of these farms in the arable area too exceeded by far the average of the historical territory of Hungary. Of landed properties between 100 and 1000 cad. yoke existing on the whole pre-war area of Hungary an average of 45·62–58·10 per cent fell within the new frontiers, while of large estates above 1000 cad. yoke 68·73 per cent (!). Even more significant was the share of these farm categories in the arable area. Of the total arable area of farms larger than 1000 cad. yoke 70·12 per cent fell within the new borders, which was quite natural, since in the regions surrounding the present territory of Hungary the large estates were mainly covered by forests. However, the large estates blocked the perspectives of peasant life to a much greater extent on the new area of the country.

The structure of farms larger than 100 cad. yoke on the new area of the country considerably differed from that of Hungary before 1918. The acreage of arables was relatively higher, and the area of meadows and vineyards was larger too. Livestock farming on the large estates was carried on to a lesser extent, and the proportion of forest area was lower here, which meant a higher labour requirement of these farms compared to the disannexed parts. Owing to the higher proportion of large estates crop production as a whole was undoubtedly more intensive on the present area of Hungary than in the disannexed regions. The role played by

large estates in crop growing was thus more important on the new area. This may have been responsible for the unprecedented power with which the owners of the large estates clung to their lands after 1918 in spite of the fact that most of them were aware of the increasing social stress and the necessity of a land reform. Namely, parcelling before 1918 was carried out in Hungary at the expense of forests and other less useful areas, while after 1918, within the present borders, it would have affected valuable arables. (In the disannexed parts of Hungary the proportion of small holders was much higher, namely, settling before 1918 was concentrated on these regions.) So the refusal on the part of large estate owners to consider the idea of a land reform after 1918 can be explained with this structural difference too.

The influence exercised by the change in area on the social structure of agriculture now slowly enfolds before our eyes. We cannot, however, leave the landless strata out of consideration either, as they formed a considerable part of the society even before 1918. A large proportion of these strata – 47·4 per cent of the farm servants and 42 per cent of the agricultural labourers – lived on the present area of the country, since they found employment mainly on the large estates. Accordingly, when examining the distribution of the agricultural population by occupation we get a picture of the difference the new territory of the country shows in this respect (Table 20).

Thus, within the total number of agricultural population the ratio of those living mainly or entirely on wages was considerably higher on the new area of the country. The ratio of farm servants and various agricultural labourers was 33 per cent on the old, and 45·7 per cent on the new territory of Hungary, that is, it was – even in 1918 – nearly half of the agricultural population; and when including those who, though having some land, could not sustain themselves and their families by working exclusively on it, and lived mainly from wages, the proportion of the agricultural working strata was far above fifty per cent of the agricultural population on the present area of Hungary. Thus, on the new area of the country the ratio of those – living on wages – who were exposed to changes in the economic conditions was much higher than that of the owners of landed properties producing mostly to cover their own requirements. As for the agriculture of Hungary, suddenly exposed to the influence of the world market, this change was unfavourable. From this point of view it is especially important that it was the ratio of

	Territory of Hungary	
	old	new
Owner and tenant	35·2	31·4
Other self-dependent	0·5	0·7
Assisting family member	36·1	21·9
Farm employee	0·2	0·3
Farm servant	9·9	14·7
Agricultural labourer	23·1	31·0
	100·0	*100·0*

Table 20. Percentage distribution of agricultural producers in 1910(18)

Size of land owned or rented cad. yoke	Territory of Hungary	
	old	new
0– 10	66·4	64·0
10–100	32·5	34·2
Above 100	1·1	1·8
	100·0	*100·0*

Table 21. Percentage proportions of landowners and tenants (20)

working categories rather than that of farm servants that was higher on the new territory; farm servants were in a much more favourable position under the conditions of the crisis than the landless masses of workmen(19).

Hence, the areal changes involved a higher ratio of poor wage-workers within the agricultural population, but there were structural changes in the landowning class too. Their proportion within the agrarian population was lower on the new territory of the country, and the ratio between the individual categories was different too (Table 21).

The proportion of large estates above 100 cad. yoke as well as the percentage of peasant landed properties larger than 10 cad. yoke were much higher on the new territory. The ratio of landowners (tenants) owning more than 100 cad. yoke was higher by 50 per cent, and of those working on 10–100 cad. yoke by 6 per cent than on the total territory of Hungary before 1918. The number of those possessing less than 10 cad. yoke was, on the other hand, lower by some 3–4 per cent. Thus the difference decidedly favoured the large estate which increased the polarization of the agricultural population – anyway high within the present borders.

As a consequence of the territorial modifications significant changes occurred in the production, management and social structure of Hungarian agriculture, of which not only the correction but even the mere realization took a long time. When the new territory began to assume a new independent role, a country of substantially different agricultural structure – compared to the former – came into existence. On the present area of Hungary the production was different, there occurred – at least temporarily – a surplus, and in other cases shortage of commodities produced earlier in abundance, the economic life of the country became disturbed, and new conditions were created to which the country had to adapt. All this was greatly increased by a new and even more important change: the economic consequences of Hungary having become independent, after the collapse of the Austro-Hungarian Monarchy. In short: a radical change occurred in the possibility of disposing agricultural products.

The disintegration of the Austro-Hungarian Monarchy had an extremely great influence on economic life in Hungary and thereby on agriculture too. The break up of the Monarchy and establishment of the successor states released the forces of nationalism and chauvinism and the autarchic tendencies of the national bourgeoisie of each successor state. There developed an anachronistic situation where simultaneously with the intensive growth of industrial production forces and revolutionization of transport causing a gradual but rapid integration of

countries all over the world, the countries of Central and Eastern Europe, becoming independent in 1918 and after, followed the policy of national isolation and self-supporting economy. So did the countries of the late Monarchy too.

Of course it was not only for agriculture that this situation was disadvantageous, although its most adverse effects were undoubtedly felt here. Austria and Bohemia, the two countries of the former Monarchy which had represented the greatest outlet for Hungary, became independent in 1918, which meant at the same time that these markets were blocked from Hungarian agriculture. The fact that these countries became independent customs areas, and so the produce of Hungarian agriculture came up against the wall of protective tariffs on the borders was not in itself unfavourable for Hungary. Difficulties arose from the fact that on these markets Hungarian agriculture had to cope with the enormous competition of the whole world market. Before 1918 the customs frontiers of the Monarchy protected the produce of Hungarian agriculture, while after 1918 it was no longer the Hungarian, but quite naturally their own agricultural produce that the customs frontiers of the new states protected. These countries could now choose from the agricultural produce of Hungary and other countries, so the earlier high export prices of Hungarian agriculture fell automatically to or below the world market level, even when these countries covered their agricultural import requirements from Hungary. In addition to these price decreasing tendencies some of the agricultural export produce of Hungary were slowly pushed out of these markets. It must be noted here that besides the disintegration of the unified customs area of the Monarchy and the fact that on the markets of the Monarchy Hungary had to cope with the competition of the world market, another factor had a part in the above process: Austria and Bohemia strove for self-support.

Even the former two factors in themselves meant an enormous disadvantage, as Hungarian agriculture, which produced anyway at a relatively high prime cost, was often compelled to sell its produce below production price on these markets. The autarchic tendency resulted, in addition, in a catastrophic reduction of outlets, and shifted the export from traditional near-by markets to more distant ones, which in turn involved a further rise in costs. Beyond all this the competition set increased quality requirements and called for the establishment of an export organization the country did not have before.

The export problem was important, since there were years when a considerable part of the agricultural production of Hungary, of certain products sometimes 50–70 per cent, could be exported. During the decades following 1918, 13–76 per cent of the different goods was exported, or else, this part of the production was difficult to place on the domestic market. Later we shall analyse the possibilities of export in detail, now we only want to underline that as a consequence of the unified customs area of the Austro-Hungarian Monarchy having disintegrated, the agricultural production of Hungary lost its reliable markets, its reactivity to the world market grew in an extraordinary measure and its dependence on the world market increased(21). In addition to these changes, adverse in themselves, after 1918 the perspectives of agriculture became unfavourable all over the

world, the stocks accumulated, and the prices – except for some commodities – were low. This situation had almost catastrophic consequences for agriculture in Hungary imposing on it deeply depressed export prices. Thus, even if agriculture had been protected before 1918 came to pass: the prices were determined by the world market prices rather than by the production cost, that is, in an economic sense Hungary often exported at a loss.

All these consequences were made even more serious by a further circumstance: stagnation of the internal market. After 1918, industry did not develop so rapidly as it was expected to, and this highly limited internal market did not grow in the required measure. Some regions of the former territory of Hungary (e.g. Transylvania) which had been dependent on agricultural imports were annexed in 1918 to agricultural countries and thereby lost for Hungary as markets; and the new area was – even as a market – considerably poorer. The industrial population of the regions left in place of the developed industrial population of Austria, first of all of Vienna and the Lower Austrian industrial area, as well as of the Bohemian Basin, which represented a high level well-paying market; the capital (dimensioned originally to a country three times as large) at present becoming impoverished and economically weakened; the Hungarian towns not yet broken away from agriculture; the vast proportion of agricultural producers within the total population of the country – all this reduced the internal market of agricultural production to a considerable extent.

The market conditions, export possibilities and problems of internal product disposal of Hungarian agriculture gradually became critical. The changes taking place in 1918 confused the network of earlier outlets established in the course of a century's development. Increased competition on the world market destroyed the relatively favourable earlier marketing possibilities of Hungary.

Changes taking place after the First World War as a consequence of the disintegration of the Austro-Hungarian Monarchy and the peace treaty resulted thus in essential modifications in the structure of Hungarian agriculture and agrarian population. It followed from the fact that the territory of the new country which before 1918 had been the central area of Hungary, was connected economically with the border areas of the country. Production here and there completed each other. The progress of capitalism created a labour division not only between the individual countries of the Monarchy, but also between the regions of Hungary. The regions of the country were characterized by different phases of development. Production in the inner parts of the country was more intensive, required higher inputs than the border areas which completed it, and the territorial changes broke these economic relations all at once. This determined the structure of agricultural production developed on the new area of the country, which earlier had fitted into the agricultural production of pre-war Hungary. On the new area of the country the structure of agriculture was more intensive than on the total area of Hungary before 1918, but owing to the poor market conditions this degree of intensity was more and more difficult to maintain. Therefore, the proportion of one-sided cereal production increased after 1918. From a social aspect the weight

and role of the large estate suddenly grew, and the genuinely divergent rural population showed even greater disproportions. All this would have determined the way, trend and – to some extent – even the methods of further development too, but the whole socio-economic system of the country did not make the evolvement of a large-scale agricultural policy possible either in production, or in marketing or in the field of social transformation.

Notes

(1) We cannot, naturally, deal here with all questions of Hungarian economy but restrict ourselves to the problems of agriculture; any other subject will only be referred to in case it had some influence on agriculture and its development.
(2) T. I. Berend–Gy. Ránki: Magyarország gazdasága az első világháború után 1919–1929 (Economy of Hungary after the First World War 1919–1929). Budapest, 1966. 31.
(3) Magyar Statisztikai Szemle, 1923, 389.
(4) Idem. 291.
(5) It is thus a remarkable achievement that in the inter-war period Hungarian agriculture produced at least the same quantity per cad. yoke as before 1918. Only if we leave the peculiarities and economic relations of agricultural production out of consideration can we make agriculture alone responsible for the stagnation. A great achievement was to maintain the level at all.
(6) Magyar Statisztikai Szemle, 1923, 296.
(7) Idem. 16 and 293.
(8) On the basis of the "Magyar Statisztikai Évkönyvek" (Hungarian Statistical Yearbooks). See further: Buday: op. cit. 76–81 and "A magyar mezőgazdaság és a békekötés" (Hungarian agriculture and the conclusion of peace). 8.
(9) In the latter case on the basis of manure requirements (arable is taken for 1, garden for 2, vineyard for 2, and meadow for 1·5 unit).
(10) Magyarország földművelésügye az 1926. évben (Agriculture of Hungary in 1926). Budapest, 1929. 27 and Magyar Statisztikai Évkönyv (Hungarian Statistical Yearbook). 1926. Buday: Magyarország küzdelmes évei (The hard years of Hungary). Budapest, 1923. 77–80 and National Archives: Preparation of peace.

Yield averages of hay according to farm groups (q/ha) 1933–1936

Year	Below 20 cad. yoke	20–100 cad. yoke	100–1000 cad. yoke	Over 1000 cad. yoke	National average
1933	27·4	25·7	25·6	25·3	26·4
1934	22·1	21·1	21·3	21·1	21·6
1935	18·9	18·3	17·9	17·5	18·3
1936	24·7	23·7	24·2	23·7	24·2
Average of 1933–1936	23·3	22·2	22·2	21·9	22·6

(11) The subsequent table presents the hay yield of four years. The low per hectare averages show the poor yields of natural grassland areas on the present territory of Hungary. The regularly highest hay yields of the smallest peasant farms – as contrasted with most of the other crops – can be explained by the fact that on the present area of Hungary it was in the small peasant farms that the ratio of natural grassland area to livestock

was relatively the lowest (in these farms there were more animals), therefore in these farms peasants were forced to make greater efforts in caring for the meadows than in larger farms or large estates, where livestock density was essentially lower.

(12) Magyar Statisztikai Szemle, 1923, 296.

(13) National Archives: Preparation of peace.

(14) On the basis of the 1911 registration of animals and the areal data of the same year.

(15) For the calculations see National Archives: Preparation of peace.

(16) On the basis of comparing the livestock registration data and the arable area of 1911.

(17) Magyar Statisztikai Szemle, 1923, 297. and National Archives: Preparation of peace.

(18) Magyar Statisztikai Szemle, 1923, 292–293.

(19) Idem. 292; cf.: Buday: op. cit. 62–63.

(20) Buday: op. cit. 60.

(21) It is a different question, and can be neglected here, whether this tariff system was favourable for the Austrian-Bohemian industry or the Hungarian agriculture, and for which of them it was more favourable. The question whether this tariff system was advantageous to the Austrian and Bohemian agriculture too, is not discussed.

Chapter 4

Agricultural production in the economy of Hungary

The first general statement concerns the increase in population which evidently influences the development of the country, and the agricultural production. According to retrospective calculations in 1910 7·61 million people lived on the area within the post-war borders, i.e. the density of population was 82·4/km^2. The situation changed considerably by 1920; as a consequence of an increase in the number of inhabitants (7·99 million) population density rose to 85·9/km^2. In the decades in question the number of inhabitants continued to increase, amounting to 8·68 million in 1930 and 9·31 in 1940 (within the 1920 borders likewise), which meant that in 1930, 93·4 and in 1940, 100·1 people lived on a 1 km^2 area(1). With this figure (97·8/km^2 in 1938) Hungary was the eighth on the world list for population density, but—as mentioned before—the increasing population had to be sustained by a country with undeveloped industry which in itself shows the important role of agriculture at that time.

Owing to the rather low rate of industrial development and simultaneous stagnation of agricultural production the transformation of the structure of population during the 20 years examined was very slow. In 1920, 55·7 per cent of the total population worked in agriculture, and since the agricultural population did not significantly grow subsequently, and a considerable part of the increase was absorbed by the developing industry, this proportion fell to 51·8 per cent in 1930 and to 50 per cent by 1940(2). This moderate development of industry was favourable for the whole economy of the country, and especially for agriculture. All this is, however, of theoretical importance only, as in practice a great many factors may cause modifications. For example, it is obvious that the share of agriculture must have been much larger than that presented by statistics, even if not in the statistically primary occupational categories, but in real life, since in Hungary many of those working outside agriculture were more or less connected with it by producing agricultural goods. For this very reason the numerical data mentioned can and must only be utilized in the analyses with an adequate criticism. They merely reflect the general tendencies of development and cannot be regarded as absolute numbers, nevertheless, in the period in question the ratio of agricultural population was considerably higher in Hungary than in any of the developed or moderately developed industrial countries of Europe. This level was only surpassed in the Soviet Union, in the Baltic and Balkan countries. At the same time, it should be noted that it was in Hungary of all major agricultural exporter countries of Europe that the ratio of agricultural population was the lowest (in 1930).

Thus the agricultural population made up at least half of the total population

of Hungary over the whole period examined. However, when examining the share of agriculture in the national income we obtain a quite different picture: agriculture contributed to the national income to a much lower extent than suggested by the numerical ratio of the agricultural population.

The share of agriculture in the national income – with the lowest and highest percentage values considered – ranged roughly between 42·7 and 31·6 per cent; in the period of the industrial upswing following the economic crisis – as a consequence of a relatively rapid increase of industrial production – it decreased to 33·8 per cent, the level of 1938(3). Compared to the percentage composition of the employed population, agriculture had a very small share in the national income, but through its dimensions it still occupied the most important place in national economy.

From the change in the number and composition of the population we might draw the conclusion that it created more favourable market conditions for agriculture, because as a result of the decreased number of agricultural wage earners the internal market expanded. This is so, however, only theoretically, in fact the internal market hardly grew. Although on the new territory of the country the proportion of the urban population increased, but most lowland towns can hardly be regarded as towns, in the strict sense of the word. The inhabitants lived mainly by working in agriculture and produced the bulk of their consumption goods by themselves. Industrial development meant a shift of proportions, but the real incomes paid in industry hardly exceeded 80 per cent of the pre-war level(4), that is, the increase in the consumption of population was barred by the fluctuating level of real income. The consumption of the agricultural population was on an even lower level, and throughout the whole period never reached the consumption level of urban population. So the larger part of the total production of agriculture could not be absorbed by the internal market. Consequently, a considerable part of the agricultural production continued to serve the purposes of export, and the prices were thus determined primarily by the export prices. Indeed, the share of agriculture was higher in foreign trade than either in the population of the country or in the national income. Between 1925 and 1938 the share of agriculture in the foreign trade of Hungary ranged on an average from 82·2 to 65·3 per cent. If we leave the price changes out of consideration (the export prices of agriculture fell by more than 50 per cent between 1925 and 1938), with the only exception of 1932 the agricultural export generally showed a very slight fluctuation only. Thus Hungary maintained the balance of foreign trade by agricultural export, that is, the imports of industrial raw materials and finished products were covered by the exports of agricultural products. This considerably increased the position, thus the role of agriculture within the national economy, and the necessity of agricultural development came to assume prominence.

Notes

(1) On the basis of the data of the Hungarian Statistical Year-books and of the census returns.

(2) On the basis of the 1930 and 1940 census. For 1940 see the relevant volume of the Hungarian Statistical Year-Book.

(3) For the data see: National Archives: Preparation of peace. See further: Gy. Hajpál: Magyarország nemzeti jövedelme (The national income of Hungary). Magyar Gazdaságkutató Intézet Közleményei. No. 4. 1947. March 31. 4–6 and Magyar Statisztikai Szemle. 1938. 494–495. Data different from this are presented by: M. Matolcsy–I. Varga: Magyarország nemzeti jövedelme 1924/25–1934/35 (The national income of Hungary 1924/25–1934/35). Budapest, 1936; The national income of Hungary 1924/25–1936/37. London, 1938. F. Fellner: Csonka-Magyarország nemzeti jövedelme (The national income of Hungary after 1918). Budapest, 1930. See further: T. I. Berend–Gy. Ránki: op. cit. 259–262.

(4) T. I. Berend–Gy. Ránki: op. cit. 437, at the peak of the boom, in 1929 the real income of workers was 85·1 per cent of the pre-war real income.

Chapter 5 The internal market

In the previous chapter some problems of the internal market were touched upon. It would be useful now to have a closer look at the question.

The basic factors have already been taken into account. Reasons for the decrease or stagnation of the internal market were given already when we pointed out that the level of industrial wages remained below the pre-war level almost throughout the whole period, when we emphasized that on the new territory of the country there was hardly any town where the bulk of the population was not in one way or another related with agriculture, obtaining at least a part of its consumption goods from there. The calory consumption of the population – though increasing by 26 per cent until 1937–38 compared to 1925–26 – when proportionated to the growth of population (per capita calory consumption) showed only a 16 per cent increase(1). However, the fact that this progress was only characteristic of the last years and not of the whole period is obvious from the enormous dimensions of the economic crisis, when the consumption of all products, including even certain foodstuffs, decreased to a great extent.

The stagnation of the internal market was caused in the first place by the slowing down of industrial development in the twenties and early thirties. The stagnation of industrialization prevented the internal market from expanding. Moreover, an important role was played in this by the fact that a social stratum of 3 million people (farm servants, agricultural proletarians, peasant owners of small lands), who did physical work for a living but received payment mainly in kind, practically remained outside the internal market, not only for agriculture but for industry too. Since salaries were mostly paid in kind, this vast social stratum (30 per cent of the population) only bought the most indispensable goods for money (matches, salt, petroleum to light with, tobacco and sometimes newspaper), and carried on subsistence farming in almost every respect. This had, naturally, a paralysing effect on industry, since the latter could not reckon with any purchasing power on that side.

It is at this point that the extremely harmful retrograde influence of the system of large estates becomes evident. The existence of the vast latifundia in itself made it impossible for the landless strata to get land. But the division of large estates would have been indispensable for the further progress of industrialization as well. For the internal markets of both industry and agriculture land distribution providing land property or supplementation of small plots for these strata, thus connecting them with the market mechanism, would have been equally necessary. This did not happen, however, the possibilities of an expanding internal market

were limited until at the end of the thirties industrial development was given a new impulse as a result of a boom created by the war.

As a consequence of all this the earlier proportions of the internal market were conserved in Hungary in the inter-war period. The situation in which the consumption of agricultural products remained at the same level, or even fell back as a result of a decrease in the industrial real incomes was preserved. But stability was shown also by the situation in which a considerable part of the population regarded as urban (according to certain data at least 16–18 per cent) produced agricultural goods itself. Foodstuffs were produced especially by the urban working and lower middle class, first of all in the suburbs of the capital, which in itself restricted the food trade and limited these strata to some extent from the market.

A further characteristic feature was that the differences in food consumption between the rural and urban population became consolidated. The consumption of proteins, sugar, vegetables and fruit was of a much higher rate in the town than in the village(2). Even if we take the great differences of consumption structure within the urban population – e.g. between wealthier bourgeois strata and various unskilled workers – into consideration, the townsman not employed in agriculture was in a more favourable position in this respect. The mere circumstance that a person was a partaker in money circulation modified his consumption to a great extent, while the consumption of the peasantry and especially of the poorest peasant masses remained at the lowest level. In this respect differences were much greater in Hungary than in developed industrial countries where the differences in food consumption between village and town were disappearing even before the First World War.

Most characteristically, food consumption was the lowest in the very stratum that produced it: the peasantry. From the aspect of the market of agricultural produce the main problem lay in the fact that the living standards of the whole agricultural population having dropped compared to the pre-war level, the consumption of peasant masses was so low that the possibility of an expanding internal market was precluded. In the Hungarian rural society the food consumption of landless farm workers and servants as well as of dwarf holders wavered, in general, between the level of undernutrition, and sometimes even of starvation. The high ratio of this stratum to the total population made any substantial increase in the internal market impossible, and at the same time, the consequent low wages checked the expansion of the internal market of industry as well.

To confirm what has been said above let us give some figures. According to statistical data of 1934–38 the average per capita consumption of those years in Hungary was 33 kg of meat, 5 kg of egg, 1 kg fish, 102 l milk and dairy products, 95 kg vegetables, 147 kg flour and rice, 130 kg potato, 11 kg sugar and honey, 17 kg fat and oil. The caloric value of food consumed a day was 2805; per capita consumption of protein was 91 g, and within this of animal protein 29 g a day(3). This caloric value is not, in fact, too low, but in any case lower

than desirable. The composition of food represented, however, a much greater problem. The carbohydrate (flour, potato, etc.) consumption of the population was much above the optimum, while foodstuffs of animal origin as well as sugar, vegetables and fruits fell into the background. An extremely high contrast was found in the consumption of the peasantry. A survey made in 1938 found the following patterns in the consumption of urban and rural population: the consumption of flour, potato and legumes was considerably higher in the agricultural population, while that of meat, fat, eggs, sugar, fruit and vegetables in the urban population. This contrast is not difficult to explain. A great majority of the peasantry consumed what it had produced, and under the given price conditions tried to reduce its expenses to a minimum. This explains the extremely low consumption of animal proteins and sugar. On the other hand, grains, flour, legumes, fat, etc. required for the sustenance of the family were produced by almost all peasant strata, agricultural workers, farm servants, etc. Perhaps the only favourable feature of this was the milk consumption of the peasantry being not much lower than that of other strata. However, to return to the main point as a result of the extremely narrow market the prices of agricultural goods remained low.

All this holds not only for the second half of the thirties. Before this time, especially in the years of the economic crisis, the consumption of the peasant population was even lower. The per capita sugar consumption was 9·5 kg in 1933 on a national average. At the same time, the average per capita sugar consumption in 700 peasant families was 2·27 kg a year, of them in 100 landless agricultural worker families only 1·25 kg, and in 100 families of farm servants even less: 1·14 kg(4). Still it was not these extreme cases but the generally low living standards of the whole agricultural population that determined the low level of consumption. After the post-war years of inflation the living standard of the agricultural population also was at its peak in 1928–29 but became very low during the years of the crisis. In 1933–34 the living standards of the agricultural population were only 69·2 per cent of that in 1928–29, while in 1937–38 they approached the 1928–29 level(5).

With regard to internal consumption that of bread grains was sufficient, with a considerable volume left even for exporting. So internal consumption in this respect could not be further increased, only the structure of consumption could have been modified at the expense of carbohydrates. Between 1928 and 1934, an annual amount of 3·2–5 million q wheat and rye was fed to animals owing to the lack of export possibilities. Grain production exceeded at least by 50 per cent, and sometimes even by 100 per cent, every year, the 12–15 million q consumed by the population. The consumption of milk and dairy products could have been higher likewise, without affecting export, since considerable stocks accumulated beyond the export supplies; and even the production could have been further increased. The consumption of fat and lard was not too high, but production could have been increased at any time without substantially decreasing the exports.

However, with the consumption of meat and poultry, even a slight increase in

average consumption, first of all by the rural population, would have essentially decreased the export of meat(6). On the other hand, the export of poultry could have been maintained at the same level, since there were possibilities of increasing the poultry stock.

There was a similarly favourable opportunity for increasing the production of sugar beet, but this was not necessary, since the export met with serious difficulties. Higher sugar consumption was a matter of money in the first place. Until the income of the agricultural population was so low, there was no possibility of raising the extremely low level of consumption. The production, naturally, could have been increased. However, with respect to vegetables and fruit, the consumption level of both was relatively low, but production – which otherwise grew considerably – could have been further increased. It was a consequence of eating habits – of course beyond the general living standard – that vegetable consumption did not show the desired rate of increase. The same applied to fruit consumption with the slight difference that the urban consumption was reduced by high prices too.

Thus with the exception of meat export the agricultural exports would hardly have been affected by an increase in the internal consumption. As it did not happen, Hungary was compelled to sell a large part of the agricultural produce on foreign markets. In spite of the relatively high density of population, the percentages of the various crops exported on the average of 1929–1938 were: 18·1 of wheat, 11 of rye, 4·8 of barley, 3·9 of oats, 3·7 of maize, 2·7 of potato, 33·3 of legumes, 6·6 of hemp fibre, 20·4 of flax fibre, 37·1 of tobacco, 26·4 of lucerne seed, 48·1 of clover seed, 8 of wine, 44·2 of onion, 14 of tomato, and 30 per cent of dessert grapes. Naturally, sugar beet, cabbage, tomato and other vegetables and fruits were exported in a processed form as well. In this way the living standard of the whole agricultural population was influenced by the price changes on foreign markets. All this is best reflected by the price fluctuations of agricultural produce.

Notes

(1) Data on the development of Hungarian national economy 1924/25–1937/38. Budapest, 1937. 35–36. Special edition No. 15 of the Magyar Gazdaságkutató Intézet (Institute of Hungarian Economic Research). — At the same time e.g. in Budapest between 1920 and 1937 meat consumption was 20 per cent lower than in the years preceding 1914, and even milk production seldom reached the 1913 level. See G. Szőnyi: A fővárosi élelmiszer árak az 1897–1936. években (Food prices in Budapest between 1897 and 1936). Budapest, 1940. 20 and 76.

(2) As an only example: Between 1933 and 1938 the per capita meat consumption in Hungary was 32 kg. In Budapest the same figure was about 40 kg. Szőnyi: op. cit.

(3) An excellent summary of the relevant data: B. Fazekas: Mezőgazdaságunk a felszabadulás után (Hungarian agriculture after the liberation in 1945). Budapest, 1967. 77. The data: Consumption of the population. 1960–1964. Central Statistical Office. Budapest, 1965. 116 and Collection of Agricultural Data. Vol. II. Budapest, 1965. 412. See further: Á. Ujlaki Nagy: Őstermelő gazdaságunk jelene és jövője (Present and future of agricultural production in Hungary). Budapest, 1939. 316.

(4) Incze: op. cit. 346–347. For the essential decrease of sugar consumption among agri-

cultural labourers see: OMK 1935. 241. For the trends of sugar consumption between 1926 and 1938 see: OMK 1937. 145.

(5) See: M. Matolcsy–I. Varga: op. cit. This is suggested also by the trend of the real value of agricultural money incomes which, when taken as 100 in 1929, was 99 in 1938. I. Varga: Az agrárolló jelentősége (Importance of the gap between the prices of agricultural and industrial products). Budapest, 1942. 19. (Magyar Gazdaságkutató Intézet, special edition No. 20).

(6) This is suggested by the fact that between 1933 and 1938 the per capita beef production was 29·5 kg, while the consumption was only 23 kg. Any essential increase in consumption would have involved thus the complete stopping of exports even if production had been increased.

Chapter 6 Agricultural price trends

Apart from the trend of production, the price trend determined the place and role of agriculture, and livestock breeding in the economy of the country. An overwhelming part of the surplus of Hungarian agricultural production was exported and sold on foreign markets, therefore Hungarian prices were closely connected – at times directly, at others indirectly – with the world market prices. As a consequence of the disintegration of the Austro-Hungarian Monarchy the yield surplus was no longer exported to markets protected by tariffs, but was open to the competition of the world market, that is, from then on it was sold at world market prices. This in itself had an unfavourable effect on price conditions, since world market prices had been even before the First World War much lower than prices on the markets of the Monarchy. In the twenties and thirties, owing to the increased production and the resulting extreme over-supply, prices were generally depressed, not only in the period of the great world crisis, but in the preceding and subsequent years as well. It is not at all surprising that domestic prices were adjusted to the world market prices, for such a large part of the production was exported. This meant, at the same time, that the price level did not exceed that of the world market, at least until the economic world crisis evoked the system of government subsidies. This complicated the picture of price changes – not easy to follow anyway – even more but their general tendencies remained the same. The subsidies promoted the production of certain products, occasionally increased their competitiveness, but with the economic structure of the country remaining the same, could not bring about any radical change. So it is true for the whole period that, with respect to the major crops, the prices in Hungary were primarily determined by world market prices, and this phenomenon was extremely unfavourable for the whole agriculture.

At first glance our data seem to contradict this statement, at least concerning the 1920s. With the price level of 1913 taken as 100, in 1928 – when the prices were the highest during the whole period of 1920–1938 – a 152·1 per cent price level developed for the agricultural produce. By 1933 this price level fell to 68·6 per cent of that in 1913, which reflects the direct effect of the crisis; by 1938 it almost reached the 1913 level amounting to 98·9 per cent of it(1). These data refer to the wholesale price level of agricultural produce, since any reliable comparison with the earlier price levels can only be made with these taken into consideration. It would be much more interesting, and closer to the facts, if we took the producer's prices into account instead of the wholesale prices. However, no reliable data collected in the same way are available for the period preceding 1929, and there is

no way of making a reasonable comparison. It seems to be sufficient to refer to the fact that the producer only received a part of the wholesale price, and this part usually changed.

The wholesale price gap cannot be regarded as permanent. As a result of the economic crisis an especially significant change occurred which upset the apparently traditional order of the twenties and which was undoubtedly more favourable for the producers than the subsequent one. Under the influence of the crisis the share of the wholesale trade generally rose from the attained price and especially in plant products, while for products of animal origin this increase was not so marked. So in this respect it was favourable at that time for livestock breeding(2). When considering the whole period we cannot speak of a uniform wholesale price gap, or uniform producer's share from the wholesale price. The crisis increased the trading profit making the producer be at the mercy of trade, in which – indirectly – the world market prices, and the defenceless position of agricultural production on the world market had again a part.

Wholesale prices were much higher in the first half of the period than during the crisis and the subsequent half decade. However, the price level obviously was not the same for each agricultural produce. Even when examining the price trends in the two main groups of goods only – for products of plant and animal origin, respectively – we can draw most valuable conclusions (Table 22).

Year	Produce of		Total 1928 = 100%	Changes compared to earlier periods %
	plant origin	animal origin 1913 = 100%		
1924	155·9	121·4	148·2	— —
1928	159·1	127·8	152·1	100·0 — 2·6
1929	130·3	149·8	134·7	88·6 — 14·1
1933	68·1	69·7	68·6	45·1 — 49·1
1938	103·6	88·4	98·9	65·0 — 44·1

Table 22. Wholesale price level of agricultural produce(3) (1924–1933)

Even when examining the individual groups separately we see fundamental changes, especially when considering those price trends not included in the table, i.e. the price trends of the period before 1914. Price changes between 1850 and 1914 have already been presented in detail. Here we only refer to the characteristic fall in grain prices and increase in the prices of livestock products at the turn of the century(4).

After the First World War there was a radical change in the price structure. The economic upswing immediately following the war involved first of all a rise in prices of products of plant origin. This was felt in the first years with normal yields after the war, when exporting became possible. It was especially remarkable for wheat, but had an impact on the prices of all products of plant origin. That is why in 1928, when the price level was the highest, that of the plant products attained 159·1 per cent compared to the 1913 level. At the same time, the price level of products of animal origin only rose by 27·8 per cent, which shows that under the radically changed conditions of Hungarian agriculture it was livestock

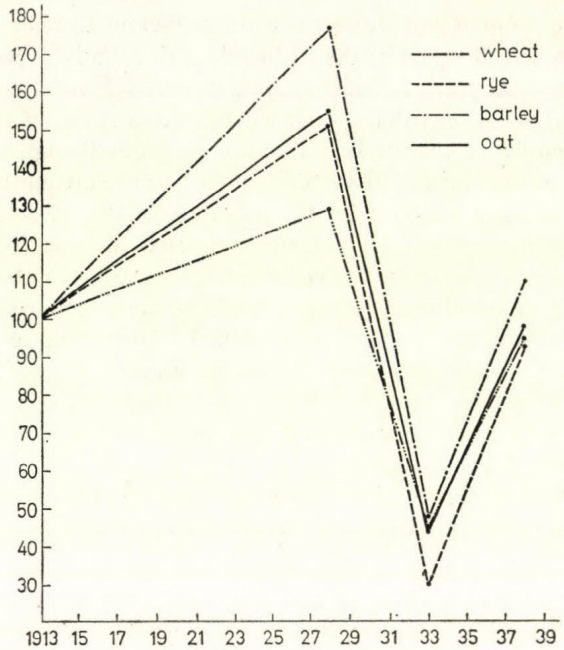


Fig. 19

Figs 19–22. Wholesale price indices of some products, 1913–1938

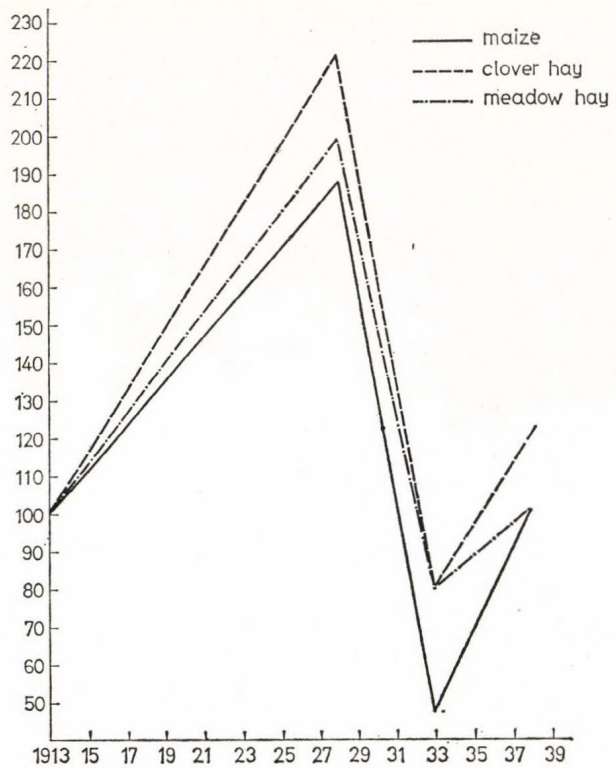


Fig. 20

Fig. 21

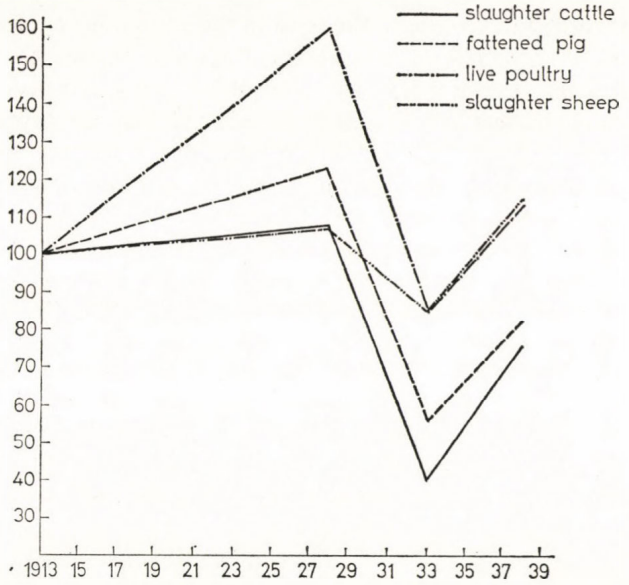
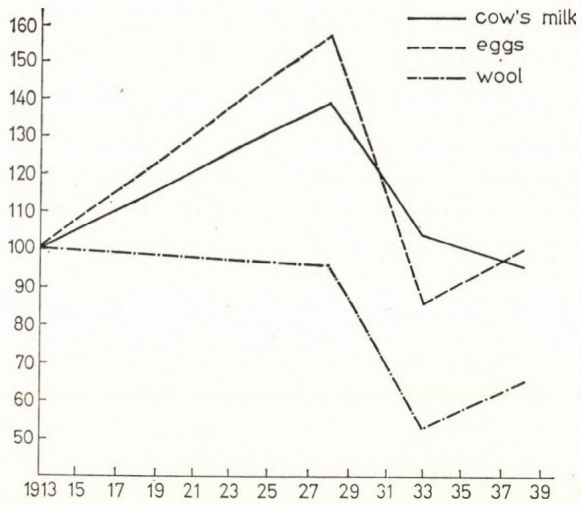
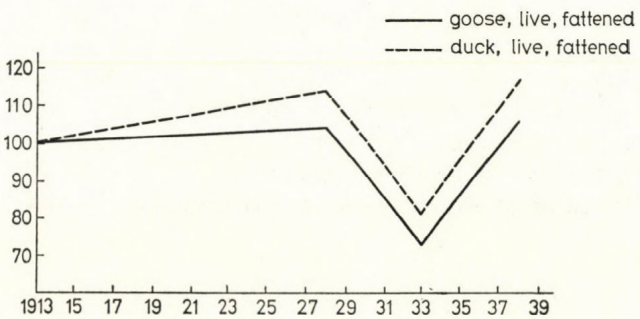

slaughter cattle
fattened pig
live poultry
slaughter sheep
160
150
140
130
120
110
100
90
80
70
60
50
40
30
1913 15 17 19 21 23 25 27 29 31 33 35 37 39

Fig. 22


cow's milk
eggs
wool
160
150
140
130
120
110
100
90
80
70
60
50
1913 15 17 19 21 23 25 27 29 31 33 35 37 39


goose, live, fattened
duck, live, fattened
120
110
100
90
80
70
1913 15 17 19 21 23 25 27 29 31 33 35 37 39

breeding that suffered the most in those years by the loss of earlier outlets. As seen before, in 1928 the average price level compared to 1913 rose by 52·1 per cent. In that year – earlier years cannot be taken into account owing to the effects of price fluctuations caused by inferior yields – the price structure of 1913 was still more or less effective. With 1913 taken for 100, the index numbers were 101·6 for plant products and 98·4 for livestock products, that is, if we consider the extent these groups deviated from the general price conditions, we do not find any significant difference which could have upset the earlier balance.

However, during the economic crisis, between 1929 and 1933 it was quite different. The first signs of the crisis appeared in the grain prices. In 1929 already the price level of products of plant origin did not even reach 90 per cent of the previous year's price level, the overall price level of agriculture fell by more than 10 per cent, while the prices of products of animal origin still rose. Then after 1929 an unprecedented price fall occurred in all branches of agriculture. The price level of 1933 (and it was not the worst year at all) was only 68·6 per cent of the 1913 level, and within that of plant products 68·1 per cent, while of livestock products it was 69·7 per cent. The price changes upset the earlier balance maintained by state support. Namely, the grain prices were subsidized to a greater extent than the prices of animal products. Consequently, the prices of plant products did not fall so much as those of livestock products, that is, their mutual price ratio changed. In fact, the proportions returned to those of the middle of the last century, that is, much higher plant and lower animal prices compared to the 1913 level. After the crisis, as a sign of a slow recovery, the earlier ratios began to emerge again, in 1938 they were about the same as in 1913, but the overall price level of agriculture decreased considerably, the high level of prices that had characterized the twenties disappeared, the prices still remained somewhat below the 1913 level. Of course, the prices did not vary uniformly, for the prices of plant products were slightly higher, while those of animal products much lower than in 1913. Thus as for the period as a whole a fundamental change occurred in the thirties, with price conditions favouring the products of plant origin *at the expense of those of animal origin.*

Within the roughly outlined change in prices the price of each product altered considerably. It is not worthwhile dealing with all aspects, so only the price changes of some major products will be presented in Table 23.

From the table one can see at once that the price level considerably changed by 1928, though not in the same measure for all agricultural products. The price of cereals increased. In 1928 wheat was sold at a 29 per cent higher price than in 1913, but the price level of all other grain crops rose by 50–75 per cent compared to 1913. The situation was the same with row crops; the price level of both maize and potato became extremely high, the latter rising by 200 per cent! Compared to them the price level of the livestock products listed in the table remained unchanged, its increase being a mere 20 per cent. Any significant increase in the price level can only be found in eggs, milk and live hen.

The effects of the economic crisis can clearly be seen from this table. By 1933 the price level of cereals fell substantially, to 44–45 per cent of the 1913 level,

Product	1928	1933	1938
Wheat	129·0	45·3	94·9
Rye	150·8	29·6	93·2
Barley	176·9	48·4	109·7
Oat	155·3	43·5	97·7
Maize	187·8	47·9	101·6
Bean	199·0	46·8	97·1
Pea	115·1	25·9	26·9
Potato	300·0	76·3	127·2
Beef-cattle	108·1	40·4	75·8
Slaughter calf	126·3	57·6	80·5
Fattened pig	122·7	56·3	82·8
Sheep for slaughter	107·7	84·6	115·4
Hen, live	159·5	86·2	112·9
Chicken, broiler	134·8	78·0	115·6
Goose, live, fattened	104·2	73·9	105·5
Duck, live, fattened	114·3	81·3	117·0
Cow's milk	139·3	103·6	96·4
Egg	157·1	85·7	100·0
Wool	95·8	52·6	65·1

Table 23. Wholesale price of some agricultural produce (1928–1938) (1913=100%)(5)

but by 1938 reached or slightly exceeded the price level of 1913. However, the prices of products of animal origin neither fell by 1933, nor increased by 1938 to such an extent as those of the grain crops; they only attained 75–80 per cent of the 1913 level(6).

The price of wheat (and rye) decreased the least, due to the government subsidy. Maintaining it at a relatively high level which was of decisive importance for the general price level of agriculture. The other products generally were sold at much lower prices, the fall in prices was essentially of greater extent even if we take into consideration that the 1929 price level was already the result of a sort of decline of prices preceding and foreboding the crisis.

It is quite remarkable that the fall in prices of livestock products was much greater than that of plant products. The prices of cattle and pig settled ultimately at a much lower level than those of grain crops, resulting in an extensive agricultural development. However, this was not only a direct consequence of the crisis, but also to some extent of the price policy of the government. But for the subsidy granted to cereal production it would have happened the other way round, or at least the price levels of products of plant and animal origin would have evened out. Naturally, this would have involved not only economic but political consequences too; without state support the large cereal producing farms could hardly have a minimum profitability.

In spite of the inner disproportions all this seems to indicate that in the twenties the agricultural price level increased significantly in comparison with the 1913 level, and even after the crisis did not fall below it. However, comparing agricultural prices without simultaneously examining them in relation to the prices of industrial products may give an unreal picture of the situation. What was thus

Table 24. Price trends of agricultural and industrial products (1924–1938) (1913 = 100%)

Year	Agricultural products (producer's price)	Industrial origin fuels	Industrial consumption goods	Total industrial products	Operative price gap		General price gap	
					agricultural −	industrial +	agricultural −	industrial +
1924	161·1	169·7	188·6	184·8	— 5·1	—	—12·8	—
1928	140·1	154·0	155·9	155·5	— 9·0	—	— 9·9	
1933	71·0	124·6	119·8	130·8	—43·0	—	—45·7	—
1938	87·5	141·3	156·6	153·5	—38·1	—	—43·0	—

the actual situation like? Can we speak of an agricultural price gap (compared to 1913), or is it an industrial price gap that we should speak of instead?

It is very difficult to examine these questions, since the price ratios of 1913 taken as a basis were upset very soon after 1919, partly under the influence of the world market prices, partly as a consequence of losing certain outlets or partly with the disintegration of the Monarchy, and not in the least as a response to the changed production structure within the new frontiers. The prices of individual products did not follow the general price movements either in industry or in agriculture. To entangle this confusion, a general comparison will be made between the agricultural price level and that of some industrial products and then the actual prices of certain products will be compared (Table 24)(7).

Studying the trends of price ratios reveals the highly *unfavourable* position of agriculture. It was in vain that the prices of agricultural produce (here the producer's prices are to be considered, while in the case of industrial products it is, in fact, the consumer's – i.e. retail – prices rather than the wholesale prices that would be of interest) rose far above the 1913 level in the period examined, if this increase generally was exceeded by an increase in the prices of industrial products. In comparison with 1913 essential changes occurred in the price structure in favour of industrial goods in the very first years following the First World War, which were caused mainly by a tendency to promote the development of industry as well as by the independent customs tariff that made a considerable increase in prices of Hungarian industrial products possible. This increase lasted to the second half of the twenties when the prices of industrial products began to decrease. At the peak of the agricultural boom, in 1928, when agricultural prices were the highest compared to 1913, the price ratio between industrial and agricultural products showed a slight improvement – owing to a decrease in the industrial prices relative to 1924 –, although the difference was still substantial compared to 1913 (an about 10 per cent agricultural price gap). This was the *best ratio* (!) for agriculture between the two world wars. And although a 10 per cent price gap had to be even then reckoned with, the fact that the ratios of 1913 were still more or less effective shows that the situation was relatively favourable(8). The quite high producer's price level which developed parallel to the high world market prices – though unfavourable for agriculture – ensured at least the balance at the cost of minor modifications. The

favourable agricultural price trend of the last three decades of the 19th century had long been a thing of the past. In the new situation the agricultural price level could at the most keep pace with industrial prices.

All this was radically changed by the economic world crisis. Agricultural prices began to decline in 1928 already, which meant a price gap of about 8–10 per cent even if compared to the previous year. In the years of the crisis the prices – first of all those of agricultural produce open to the fluctuations of world market prices underwent a sharp fall. The price level of industrial products did not in the least show the same rate of decrease, since industrial production was mostly realized at home, and through the influence of the tariff system was not open so much to competition from abroad. This can be seen from the data of Table 24 too which clearly shows that the *agricultural price gap was more than 40 per cent* during the crisis, and this situation did not substantially change even by 1938. Although the price level began to rise in 1938 both in industry and agriculture, the agricultural prices started from such a low level that they could not possibly reach the price level of industry.

As a consequence of all this, in the period between 1920 and 1938 agriculture got into a highly unfavourable position compared to the pre-war conditions. The situation became even worse after 1929 when the price gap was almost unbearable for agriculture. Thus, perhaps the most serious problems of agricultural development in the twenties and thirties are to be found in this phenomenon; it explains the stagnation and makes it understandable why the development of agriculture stopped in that period, as the lack of capital, debt – not to mention others – are all logical consequences of this situation.

To give a clear picture of changes in the price gap we shall examine the prices of some agricultural products and the most important fuels, as well as those of industrial articles required for production and of some consumer goods related to each other, since a great many particulars possibly influencing these ratios have to be taken into consideration. We must keep in view, especially when choosing the agricultural produce to be examined, that while for some farms certain products represent commodities to be sold, for other farms the same products may be means of production (e.g. maize, barley, oats, etc.). That is, a price change may have a favourable effect on one farm, at the same time, adversely influencing the other. We endeavoured, therefore, to choose "pure" crops with which these disturbing factors can be avoided. These are wheat, potato, wine, milk, fattened pig and eggs (Table 25). With the industrial articles we had to keep in mind that beyond the production means a minimum of personal needs too must be reckoned with. That is why petroleum, cotton cloth, footwear and sole leather were included in our list of industrial articles. Fertilizer, brick, timber, crude iron bar, plough, sack are obviously industrial products hardly dispensable in agricultural production.

We are aware of the fact that the data of this table are not suitable for drawing general conclusions from. But this was not the aim either; we wanted to approach the subject by actual analyses of the details. It is obvious that the purchasing

Table 25. Price ratios of some products in 1919–1938(9)

1 q superphosphate could be purchased for:

		1913	1929	1933	1938
Wheat	kg	35·2	43·2	88·1	46·8
Potato	kg	140·2	64·6	175·0	121·1
Wine	l	23·1	34·7	59·6	52·3
Milk	l	32·5	27·6	32·9	36·7
Fattened pig	kg	5·8	6·1	11·2	9·4
Egg	piece	130	78	159	141

1000 bricks could be purchased for:

		1913	1929	1933	1938
Wheat	kg	138·9	194·8	323·2	139·1
Potato	kg	552·4	291·3	642·2	361·0
Wine	l	91·1	156·3	218·7	155·6
Milk	l	128·2	124·3	120·7	109·0
Fattened pig	kg	22·9	27·5	41·2	27·8
Egg	piece	513	354	583	421

1 m^3 building timber could be purchased for:

		1913	1929	1933	1938
Wheat	kg	201·7	221·0	372·8	326·6
Potato	kg	802·0	330·5	740·9	846·0
Wine	l	132·3	177·4	252·4	365·4
Milk	l	186·1	141·0	139·2	256·5
Fattened pig	kg	33·2	31·2	47·5	65·3
Egg	piece	745	402	673	990

1 kg petroleum could be purchased for:

		1913	1929	1933	1938
Wheat	kg	1·5	1·3	2·7	1·6
Potato	kg	6·0	2·0	5·0	4·3
Wine	l	1·0	1·1	1·8	1·8
Milk	l	1·3	0·8	1·0	1·3
Fattened pig	kg	0·2	0·1	0·3	0·3
Egg	piece	5	3	5	5

1 q crude iron bar could be purchased for:

		1913	1929	1933	1938
Wheat	kg	89·2	116·2	270·8	145·8
Potato	kg	354·6	173·7	542·1	377·7
Wine	l	58·5	83·2	183·3	163·1
Milk	l	82·3	74·1	101·1	114·5
Fattened pig	kg	14·5	16·4	34·5	29·1
Egg	piece	329	211	489	442

1 (single-blade) plough could be purchased for:

		1913	1929	1933	1938
Wheat	kg	256.2	360·0	738·6	424·3
Potato	kg	1 499·0	538·3	1 467·8	1 099·0
Wine	l	247·3	289·0	500·0	474·6
Milk	l	348·0	229·7	275·8	333·3
Fattened pig	kg	61·7	50·8	94·1	84·9
Egg	piece	1 392	654	1 333	1 286

1 sack of grains could be purchased for:

		1913	1929	1933	1938
Wheat	kg	5·6	8·6	13·4	8·2
Potato	kg	22·3	12·9	26·7	21·2
Wine	l	3·7	6·9	9·1	9·1
Milk	l	5·2	5·5	5·0	6·4
Fattened pig	kg	0·9	1·2	1·7	1·6
Egg	piece	21	16	24	25

1 kg sole leather could be purchased for:

		1913	1929	1933	1938
Wheat	kg	24·1	28·7	43·6	26·8
Potato	kg	95·8	42·9	86·7	69·4
Wine	l	15·8	23·0	29·5	30·0
Milk	l	22·2	18·3	16·3	21·0
Fattened pig	kg	3·9	4·0	5·5	5·3
Egg	piece	89	52	79	81

1 pair of high boots for men could be purchased for:

		1913	1929	1933	1938
Wheat	kg	59·4	83·0	107·6	58·9
Potato	kg	236·3	125·3	213·9	152·6
Wine	l	38·9	67·2	72·8	65·9
Milk	l	54·8	53·4	40·2	46·2
Fattened pig	kg	9·7	11·8	13·7	11·7
Egg	piece	219	152	194	179

1 metre cotton fabric could be purchased for:

		1913	1929	1933	1938
Wheat	kg	2·7	3·5	6·3	2·9
Potato	kg	10·7	5·2	12·6	7·5
Wine	l	1·7	2·8	4·3	3·2
Milk	l	2·5	2·2	2·3	2·2
Fattened pig	kg	0·4	0·4	0·8	0·5
Egg	piece	10	6	11	9

power of agricultural produce did not change uniformly (nor did the price level of the industrial goods presented). In 1929 generally more was required from wheat, wine, and in some relations fattened pig, and less from the other products to buy the same amount of industrial articles. All this radically changed by 1933, when for the same amount of industrial articles much higher quantities needed to be given of *all* products examined than in 1929. The numerical analysis of data is not necessary here, the main point is quite clear: in 1933 almost twice as much had to be given of most products for the same amount of industrial goods as four years earlier, the exchange rate became thus extremely unfavourable for agricultural produce. By 1938 the situation showed a slight improvement; smaller quantities of agricultural produce needed to be given for the same amount of industrial article than in 1933, but—with a few exceptions—the ratio was almost everywhere much higher than in 1929.

We can follow the changes of inner proportions too. In 1939—compared to 1933—the purchasing power of wheat, potato and wine increased, while the exchange rate of pork, milk and egg continued to decrease, indicating a decline in the prices of livestock products, namely, for the same amount of industrial product generally more products of animal origin had to be given than earlier.

As mentioned before, all this is not sufficient for drawing overall conclusions. The data presented here are suitable mainly for demonstrating the difficulties of farms—especially of small peasant farms—in the examined period and for explaining the troubles of peasant families. The general conclusions had already been drawn when we emphasized what difficult situation agriculture in Hungary had got into, especially in the thirties. Without taking these into consideration the depressing conditions of agricultural production at that time simply could not be understood. It must be underlined, however, that the large price gap in itself cannot be responsible for the situation. The mere fact that more agricultural produce have to be given for the same amount of industrial goods rather promotes agricultural production. But in a situation when the market possibilities of Hungarian agriculture did not increase, on the contrary, as a consequence of the unfavourable price conditions they even decreased, and therefore productivity in agriculture did not grow either, the increasing price gap had a negative effect on production, as it meant exclusively an undesirable change in price ratios. These were, in fact, the conditions that determined the situation characterizing by and large the whole agricultural production: stagnation and occasional lapse(10).

Notes

(1) "A magyar mezőgazdaság árhelyzete az utolsó évszázadban (1867–1963)" (The price conditions of Hungarian agriculture in the last century (1867–1963)). Budapest, 1965/6. 15. (Statisztikai Időszaki Közlemények. Vol. 73.)
(2) Idem. 20.
(3) Idem. 15.
(4) For this process see the data idem. 9–11 and 26.

(5) Idem. 61.
(6) Incze: op. cit. 231–232.
(7) The price conditions of Hungarian agriculture . . . 34.
(8) The ratio of 1913 is highly remarkable from this point of view, as it was the result of a nearly fifteen years' development during which the ratio of industrial and agricultural prices remained almost unchanged, that is, the 1913 conditions reflect a state of permanent balance.
(9) Prices published in the journal "Köztelek", corrected and completed on the basis of data given in the Hungarian Statistical Year-Books (Magyar Statisztikai Évkönyv).
(10) The customs policy protecting industry had another consequence besides remarkable increases in industrial prices: the inferior quality of products which seriously affected the producers, especially the peasants who bought primarily home-made industrial products. We are not, however, going to dwell on this question.

Chapter 7 Agricultural export

The disintegration of the Monarchy in 1918 fundamentally changed the economic conditions of Hungary. As seen before, on the new territory of the country the structure of agriculture, and to some extent the composition of the rural population too, was different from those on the total area of Hungary before 1918. There was, however, something that could not essentially change: the volume of agricultural production. The new area of the country continued to produce much more food, and agricultural products in general, than was required for consumption. In this context it is, in fact, unimportant what it was that this production surplus arose from, whether it was an actual overproduction, or the inability of a considerable part of the population to buy the necessary amount of food. The fact remains that the agriculture of Hungary could not do without a large-scale export activity.

The situation did not change much, if we look at it on the surface. Agricultural production in Hungary exceeded the demand of domestic consumption even before the disintegration of the Monarchy, and large volumes were exported at that time too. Still, the change after 1918 was of extreme importance. Namely, while before 1918 only a small percentage of the total exports of Hungary went customs abroad, after 1918 any export to the areas of the former Monarchy outside the borders of Hungary met the customs barriers of new countries, of which all consequences had to be reckoned with. The favourable position enjoyed earlier by agriculture ceased. The customs policy of Hungary served in the first place the interests of industrialization, which in Austria and Bohemia, Hungary's former suppliers of industrial goods, resulted in a reaction decreasing the preferential prices of Hungarian agricultural produce to the price level of the world market. The traditional balance between the countries of the former Monarchy was upset. Hungary raised the tariff of industrial products increasing thereby the prices of Austrian and Bohemian industrial goods, while Austria and Bohemia took over the Hungarian agricultural produce at world market prices whereby their prices became lower. We do not state that for this tendency of self-support Hungary and its customs policy were alone responsible, we do not even say that the development of this tendency could have been avoided by the realization of grandiose ideas(1), but to the agricultural export of Hungary it was undoubtedly disadvantageous, partly because exports to these countries decreased in volume, especially when under the influence of the world crisis the self-supporting tendencies strengthened, but mainly because it was exposed to the influence of world market prices. A considerable part of Hungarian exports had earlier been protected from competition

of the world market by the customs frontiers of the Monarchy; after 1918 this protection ceased.

In spite of all these difficulties agricultural export was important for the economy of Hungary, because it enabled the superfluous products to be sold at all. Taking the period as a whole, of the products put on the market 55–70 per cent grains, 38–40 per cent sugar and sugar beet, 25–30 per cent tobacco, some 35 per cent fruit, 20–25 per cent meat and fat, 75 per cent wool, 40 per cent poultry, 50 per cent eggs, 55 per cent feather and 20 per cent potato were transported abroad. And this is only a list of such products exported regularly and in large volumes after 1924. By adding those products which were once exported, then imported, the list could be substantially enlarged. The agricultural production of Hungary had been built on exports for long centuries, and this could not be changed overnight. Beyond this, however, the developing industrial production required more and more raw materials, semi-finished products and machines which could be covered almost exclusively by agricultural exports; a large part of the industrial production of Hungary was not and could not be competitive yet either on the Austrian and Bohemian, or on the Western European markets. The bulk of industrial exports went to the Balkan and Eastern European countries. The volume of exports did not, however, cover the imports; in the first decade the foreign trade balance of the new territory of Hungary was rather passive. Although in the thirties the balance showed a positive trend, even then it was the agricultural export that covered more than 90 per cent of the raw material import required for the development of industry.

Import only had a considerable role in agricultural produce in the early twenties. After the war there was a shortage of foodstuffs too, which resulted in large volumes of wheat, flour and sugar imports at the beginning of the twenties. But the restrictions concerning food export were abolished already in 1921, and the export of foodstuffs was regulated by legal orders. Food imports of any larger volume soon stopped, and from 1923 on the export by far exceeded the import(2). The import of food, and of agricultural products in general, was afterwards confined to commodities produced in insufficient quantities – if at all – on the new territory of Hungary. If we leave the seeds and breeding animals (as well as wool regarded as industrial raw material) out of consideration, the imports mostly consisted of fruits, grapes, vegetables, timber and fuel wood, eggs, dairy products, onion, wine and delicacies. Besides them maize and various fodder crops played a major role. Fodders were imported in larger amounts in part of the years during the examined periods, partly because the earlier production relations had broken off and the regions producing fodders in excess had been disannexed.

The year 1929 brought a change in this respect too. The measures taken to cut the imports down affected the import of agricultural products in the first place. Imports of dairy products, eggs, onion, potato and wine were reduced to a minimum, and those of tobacco, fruit and seed considerably decreased too. According to some, it was then that Hungary became perfectly self-supporting, which is thus attributed to the influence of objective economic factors. In fact, however, such

Table 26. The foreign trade of Hungary between 1920 and 1938(3)

Year	Imports	Exports	Balance	Percentage proportion of agricultural export to total export	Index: 1920 = 100	
	value in million Pengő				Import	Export
1920	484·1	190·6	−293·5		100	100
1921	604·0	294·5	−309·5		125	155
1922	625·7	382·9	−242·8		129	201
1923	490·7	392·2	− 98·5		101	206
1924	815·3	667·0	−148·3		168	350
1925	864·6	848·0	− 16·6	80·40	179	445
1926	941·0	876·7	− 64·3	82·20	194	460
1927	1 182·3	807·6	−374·7	79·00	244	424
1928	1 211·4	826·0	−385·4	73·80	250	433
1929	1 063·7	1 038·5	− 25·2	77·00	220	545
1930	823·4	911·7	+ 88·3	74·90	170	478
1931	539·4	570·4	+ 31·0	68·20	111	299
1932	328·5	334·5	+ 6·0	66·00	68	176
1933	312·6	391·3	+78·7	71·60	65	205
1934	344·9	404·2	+59·3	69·60	71	212
1935	402·3	451·5	+49·2	67·50	83	237
1936	436·5	504·4	+69·7	67·80	90	265
1937	483·6	558·0	+104·4	66·60	100	309
1938	410·6	522·4	+111·8	65·30	85	274

government measures were involved here which, though resulting in a reduction of the variety were not – with the exception of some products – related to the trends of internal production. In any case, as a result of this change the agricultural imports fell to 12–14 per cent of the total imports on the average. Nearly half of these was demanded by the livestock branch. An average of 10 per cent of the imported products was represented by concentrates, 20 per cent by maize, 8 per cent by wool, 7 per cent by tobacco, 39 per cent by raw hide and 6 per cent by seeds. The remaining 10 per cent consisted of various commodities.

Thus the volume of agricultural imports became negligible, and played no important role in the foreign trade of Hungary. Let us see now the trends of export in it (Table 26).

It is only with the above data taken into consideration that we can assess what the agricultural export meant for Hungary. As shown (at current prices) by the data, the foreign trade balance of the country was until 1929 decidedly passive, the value of imports regularly exceeded that of exports. Exports consisted, however, mainly of agricultural produce even in that period. In 1925, 80·4 per cent of the total export was made up of agricultural produce, and up to the economic crisis agriculture regularly supplied more than 75 per cent of the total export. A change occurred during the crisis; it was first in 1931 that agriculture had a less than 70 per cent share in the total export. During the thirties this share showed a slowly decreasing tendency touching bottom in 1938 with 65·3 per cent. Of course, this was still such a large proportion of the total export which explains why so much attention is devoted to the export trends.

This importance of export is even more supported by other aspects. First, at the end of the thirties, owing to a general fall in prices resulting in the prices of agricultural produce falling far below the earlier level, many more products had to be exported for the same money, that is, in spite of its lower share in the total export, in an absolute sense agriculture exported *more produce.*

Secondly, the actual economic importance of agricultural export lies in the fact that, when comparing the agricultural export surplus (i.e. the balance of agricultural imports and exports) to the value of imported industrial raw materials and semi-finished products, the value of agricultural exports is found to have covered that of industrial raw materials and semi-finished products even in years with a passive balance(4).

The development of agricultural export can be divided into three major phases. The first covered the post-war years until stabilization, i.e. until 1st January 1925, introduction of the independent customs tariff. The next phase lasted until 1930, the beginning of the economic world crisis, while the third encompassed the period from 1930 to 1938. This last phase could, in fact, be divided again into two parts, namely the position of export was considerably modified after 1934. However, the basic characteristic, an increasing state interference, did not essentially change after 1930.

The first phase between 1920 and 1924 was characterized by the chaotic post-war condition of agricultural production. Imports in those years exceeded the exports, at first substantially, later to a lesser extent. The agricultural export was restricted with a view to supplying the country with food and raw material. Exports were made difficult by the new situation of Hungary as an independent customs area, and by the resulting unsolved questions, although in the early twenties foreign trade with the former countries of the Monarchy was continued on the basis of the earlier situation. The provisional commercial agreements concluded ultimately solved the problems, and the export slowly came to life again(5).

The composition of produce exported in that period generally cannot be regarded as a basis of investigations, as it displays too many special features, still it indicates that the export of the new country area cannot be the same as it was before the war. For example, in the main export product, cereals, a special situation arose, namely, the government – while hindering the export of cereals – promoted that of finer flours, as the latter would not have sold on the domestic market anyway. Therefore, in that period flour was the largest item of export. Later this situation changed, export shifted in favour of unprocessed products. There were, however, more general tendencies. For example, the sudden upswing of poultry export was a remarkable phenomenon. In 1925 the exports of live and slaughtered poultry reached 70, eggs 55, goose liver 46 per cent, i.e. the export level of 1913, while the export of feather even surpassed this level, although the new area of the country was less than a third of the old one! Considerable volumes of sugar and wool were also exported and the export of various seeds gradually increased. Exports of meat and fat were evidently unimportant, the main role in the export was played by products of plant origin(6).

According to the evidence of the data by 1924 the agricultural export was more or less consolidated, the increase of production made the complete release of exports, and parallel with it the abolishment of import restrictions possible. The foundation of the second phase, the period of upswing after 1925, was laid by the new customs tariff, followed by the reorganization of finances and introduction of the new currency. The new tariff system effective as of 1 January 1925 gave preference to industry, hindering indirectly agricultural export(7), however, the world-wide economic upswing was a great relief. The volume of exports culminated in 1929, and the highest prices too were attained in 1928–29. Conclusion of various commercial agreements facilitated the export and, at the same time, determined its direction.

The next period starting with the economic world crisis placed the whole agricultural export on new bases. It is not that the volume of exports substantially decreased, in this respect the trend of the export value gives a false impression of the situation. Apart from a single year, 1932, the export volumes of agriculture remained more or less on the same level. Nevertheless, the crisis changed the situation radically in many respects, partly by modifying the inner proportions of the export established in the second half of the twenties, partly by altering the market conditions too. It was at that time that the autarchic tendencies became manifest in the neighbouring countries, the crisis even promoted their development, so the agricultural export of Hungary shifted slowly towards more distant markets. In addition, through the division of the international foreign exchange system the aspects of profitability were no longer the only regulators of the export activity, it was controlled by other economic considerations too, first of all by efforts to obtain convertible currency. State intervention too became more intensive in those years, and the export was increasingly monopolized. All this together meant the transformation of the whole agricultural export. That is why we speak of the period after 1929 as a new era, in this respect too.

The volume of exports considerably increased from the middle of the twenties and was at its peak in 1929. With respect to the volume and value of export, 1932 represented the bottom. But note that, while the value of exports in that year was only 27·5 per cent of the 1929 value, the volume of exported agricultural products was not proportionate to, but much higher than that, 47·3 per cent of the 1929 export volume. The difference in the two data reflects the basic problem, namely: the declining export prices of agricultural products during the crisis. The export prices were the highest in 1929, then a considerable fall in prices occurred as reflected by the trend of the export value, which, however, does not make it possible to follow the trends of the export volume. The export volumes certainly showed trends other than those of the export value. Apart from a considerable decrease in 1932, the volume of export remained, in fact, on the same level; no substantial reduction can be spoken of. There occurred, though, a slight decline in quantity, but the prices fell more rapidly. After 1932 the volume of exports rose again to the normal level, and during the thirties more or less remained unchanged. In fact, we cannot even say that the war preparations resulted in any

greater increase in the total volumes of exports, for in 1938 the amount of exported agricultural produce was lower than in 1937 (which, of course, does not mean that war preparations had no effect on the export of certain products). This fact suggests that the level attained in the second half of the thirties must have been the average level of export under the contemporary production and internal market conditions, and any further improvement of export would have required investments aimed at the modernization of agricultural production.

Thus, if we leave some years – partly the lean years immediately after the first world war, partly the years of the crisis – out of consideration we find the agricultural export volumes to have been more or less on the same level. This does not mean, of course, that the composition of export did not change. These structural modifications were caused by changes connected with the disintegration of the Monarchy and the new frontiers of Hungary. The decisive factor in this respect was the independent customs area coming into existence and the changed character of exports to the former countries of the Monarchy. Namely, after the First World War most countries imported as low amounts of processed products and as high volumes of raw material as possible to ensure the employment of the population. It was the result of this that the proportion of processed products shifted in favour of the unprocessed products in the agricultural export of Hungary too, e.g. cereals were no longer exported in the form of flour, but as grains. This is only an example taken at random, but one that illustrates the whole problem, since a large proportion of the export consisted of grains. The share of food products decreased from 30·3 per cent in 1925 to 25·5 per cent by 1929, and to 21·4 per cent by 1934. The situation was even worse in 1939 when the share of food products in the total export of agriculture was only 19·4 per cent(8). The structural changes of agricultural exports between 1920 and 1938 were, in fact, best characterized by this decrease in the proportion of processed products. Before 1918, processed products could be exported to the countries of the Monarchy, to the new independent countries only raw materials. It is by this phenomenon that the chronic stagnation of the Hungarian food industry between the two world wars can be explained.

Beyond this general statement the details too are of interest. Let us see the trend that the composition of agricultural exports showed in the period examined. For the sake of simplicity, when compiling Table 27 we chose the year 1929 as a basis, which meant the peak of export when the consequences of the crisis were not yet manifest in the composition of exports. From then on we follow the trends of exports from year to year(9).

The data of the table reveal very interesting details concerning both the structure of export and its changes.

In 1929 grains and flour were quantitatively the largest items of export, as for their value, however, they were less dominant; in 1929 the value of field crops hardly exceeded 50 per cent of the total export value. A radical change occurred already in 1930, the share of these products fell to 40 per cent, in 1931 continued to decrease and in 1932 remained at the same level, with about 36 per cent. The

Table 27. Composition of agricultural export according to value (1929–1938)

Commodity group	1929		1930		1931		1932		1933	
	1000 P	%	1000 P	%	1000 P	%	1000 P	%	1000 P	%
Live animals	159 935	20·1	200 701	29·8	97 239	25·7	50 228	23·1	58 772	21·1
Meat	49 061	6·2	50 106	7·5	46 490	12·3	22 051	10·2	27 924	10·0
Dairy products	346	0·0	257	0·0	238	0·0	143	0·0	435	0·2
Leaf-fat	7 119	0·9	14 149	2·1	6 213	1·6	5 369	2·5	6 701	2·4
Egg	16 283	2·1	19·239	2·9	15 575	4·1	6 426	3·0	9 573	3·4
Wool and hair (fur)	17 675	2·2	8 616	1·3	6 264	1·7	1 688	0·8	2 749	1·0
Raw hide and other animal products	32 960	4·2	21 873	3·3	17 134	4·8	7 968	3·7	10 071	3·6
Raw products of animal origin	283 379	35·3	314 941	46·9	189 153	50·3	93 873	43·3	116 225	41·7
Grains	173 932	22·3	96 923	14·5	52 750	13·9	30 890	14·3	62 519	22·5
Maize	16 901	2·1	16 022	2·4	1 080	0·3	2 555	1·2	14 907	5·4
Potato	6 443	0·8	3 634	0·5	8 413	2·2	2 060	0·9	1 108	0·4
Raw tobacco	18 030	2·3	14 752	2·2	7 484	2·0	7 270	3·4	3 892	1·4
Various grains	37 743	4·8	28 267	4·2	18 462	4·9	19 810	9·1	23 203	8·3
Raw field crops	253 049	32·8	159 598	23·8	88 189	23·3	62 585	28·9	105 629	38·0
Fruit	12 236	1·5	7 948	1·2	6 815	1·8	4 576	2·1	5 565	2·0
Onion	6 070	0·8	2 893	0·4	2 045	0·5	2 394	1·1	1 235	0·4
Wine, fruitwine	16 107	2·0	14 377	2·1	7 328	2·9	5 450	2·5	5 415	2·0
Other fresh plant products	34 413	4·3	25 218	3·7	16 188	4·3	12 420	5·7	12 215	4·4
Processed animal products	14 006	1·8	16 876	2·5	10 738	2·8	7 559	3·0	7 327	2·6
Processed plant products	178 833	22·5	115 517	20·2	55 380	14·7	26 187	12·1	24 212	8·7
Total processed products	192 839	24·3	132 393	22·7	66 118	17·5	33 746	15·6	31 539	11·3
Other agricultural products	25 858	3·3	19 567	2·9	17 499	4·6	14 047	6·5	12 751	4·6
Total agricultural export	789 538	100·0	651 717	100·0	377 147	100·0	216 671	100·0	278 359	100·0

	1934		1935		1936		1937		1938	
	1000 P	%	1000 P	%	1000 P	%	1000 P	%	1000 P	%
Live animals	44 229	15·5	56 495	18·7	62 523	18·4	72 954	19·4	66 334	20·5
Meat	30 506	10·6	43 881	14·5	41 309	12·2	32 203	8·6	37 907	11·7
Dairy products	75	0·0	150	0·1	142	0·0	264	0·1	141	0·0
Leaf-fat	15 883	5·6	27 795	9·2	18 530	5·5	18 932	5·0	16 792	5·2
Egg	8 092	2·8	7 768	2·6	6 068	1·8	9 202	2·4	10 575	1·3
Wool and hair (fur)	6 880	2·4	1 332	0·4	1 772	0·5	1 893	0·5	550	0·2
Raw hide and other animal products	15 665	5·5	11 780	3·9	12 267	3·6	19 483	5·2	13 881	4·3
Raw products of animal origin	121 300	42·4	149 201	49·4	142 611	42·0	154 931	41·2	146 179	45·2
Grains	62 443	21·8	56 578	18·8	89 327	26·4	83 842	22·3	78 259	24·2
Maize	2 397	0·8	620	0·2	419	0·1	19 162	5·1	13 053	4·0
Potato	3 458	1·2	3 747	1·2	3 464	1·0	2 574	0·7	731	0·2
Raw tobacco	4 185	1·5	3 931	1·3	3 219	1·0	2 893	0·8	2 078	0·6
Various grains	23 711	8·3	24 965	8·3	26 190	7·7	35 745	9·5	23 806	7·4
Raw field crops	96 194	33·6	89 841	29·8	122 619	36·2	144 216	38·4	117 927	36·4
Fruit	4 621	1·6	2 410	0·8	10 217	3·0	5 533	1·5	5 764	1·8
Onion	1 591	0·6	2 138	0·7	3 479	1·0	2 478	0·7	2 539	0·8
Wine, fruitwine	6 061	2·1	5 328	1·8	5 374	1·6	7 202	1·9	8 125	2·5
Other fresh plant products	12 273	4·3	9 876	3·3	19 070	5·6	15 213	4·1	16 427	5·5
Processed animal products	8 700	3·0	8 297	2·7	13 027	3·8	17 206	4·6	12 633	1·9
Processed plant products	27 485	9·6	30 114	10·0	28 874	8·5	40 286	10 7	26 170	8·1
Total processed products	36 185	12·6	38 411	12·7	41 901	12·3	57 492	15·3	38 803	12·0
Other agricultural products	20 234	7·1	14 409	4·8	13 320	3·9	3 744	1·0	4 346	1·3
Total agricultural export	286 186	100·0	301 738	100·0	339 521	100·0	375 596	100·0	323 682	100·0

share of field crops in the export value showed some substantial increase after 1935 only, and did not ever reach again the earlier 50 per cent proportion.

From the aspect of export value, animal products occupy a very important place. The share of livestock products in the export value was 37·1 per cent in 1929, which increased, however, to 49·4 per cent in 1930 and 53·1 per cent in 1931 reaching thereby its peak. Though these changes were only due to the fact that the export of livestock products decreased to a lesser extent in 1932 than that of cereals, still they clearly show the measure of transformation. The export of livestock products remained on a much higher level during the thirties than it had been in the twenties, ranging generally between 45 and 50 per cent. Thus, according to the export value the importance of livestock products increased. There were some products of which the export regularly increased during the whole period, e.g. poultry, vegetables, fruit, etc.

In the thirties export was characterized by a concentration of the basic products; it was wheat, barley, to a lesser extent maize, furthermore cattle, butter, pig, lard and bacon as well as poultry and its products (meat, feather, egg), and clover- and lucerne seeds that played a major role. These products found an increased market in the thirties, especially after 1933 when the armaments of Germany evoked military preparations all over Europe. Agricultural export assumed a new trend, the export of certain products was promoted while of others hindered. However, for the agriculture of Hungary as a whole the above listed products represented the basic possibilities of export.

The concentration of these products in export throws light upon the difference between the post-war and pre-war structure of the export. Before the First World War the bulk of export consisted of products of plant origin, even if the structure of export underwent a considerable transformation by the turn of the century, and the share of animals and animal products in the total export gradually increased. In the twenties this share showed a temporary decline, the new territory of the country exported cereals primarily, as it was shown to be more favourable by the trend of price ratios. Then in the thirties the pre-war situation was not only restored, but the export ratios shifted in favour of the animals and livestock products. Characteristically, of the twelve most important export products eight are connected with livestock breeding.

In the livestock branch the export of slaughter animals was of the largest volume. In the total agricultural export the share of slaughter and draught animals was generally 14·5–18·5 per cent; the fluctuation covers here a sort of development induced by the crisis. Namely, in the second half of the twenties the mentioned item was 14–15 per cent of the export and rose to 18·93 per cent in 1929 only; reaching the top in 1930 with 27·51 per cent of the total agricultural export. After 1930 it fell back again and was only 14·46 per cent in 1934; however, in the second half of the thirties it generally ranged between 17 and 19 per cent, that is, under the influence of the crisis both the value and the volume of draught and slaughter animal exports increased as shown by Table 28.

Accordingly, the two most important items of slaughter animal exports were

Table 28. Slaughter animal export in 1925–1938(10)

Year	Number of animals exported				Total value 1000 P
	Cattle	Pig	Sheep	Horse	
1925	102 945	107 825	45 904	11 758	82 124
1926	84 320	157 602	38 918	9 436	86 788
1927	68 871	116 142	24 745	10 639	76 669
1928	59 024	103 175	16 582	10 635	71 307
1929	83 969	272 882	42 302	13 161	161 453
1930	160 081	248 071	84 421	10 870	171 435
1931	100 127	105 194	64 923	5 889	78 243
1932	32 132	116 771	74 180	11 662	34 780
1933	69 889	159 485	55 338	10 070	47 576
1934	69 058	125 734	39 974	5 911	35 816
1935	68 976	182 980	35 594	6 726	46 005
1936	76 534	175 271	35 615	5 562	50 057
1937	105 539	165 125	43 896	4 899	62 758
1938	54 257	228 640	23 661	4 886	58 605
Average of 1925–1938	81 123	161 778	44 740	8 722	74 258

cattle and pig, making 90–98 per cent of the total export. The export of horse and sheep depended on seasonal conditions, and went mainly to the Western European market. For the cattle and pig export, however, the traditional markets of Czechoslovakia, Austria, Germany and Italy were the main outlets, where – with the exception of a few years – cattle and pig sold in increasing numbers. The export was at its peak in 1929–30 and never again reached this level (160 000 cattle, 272 000 pigs) though at the end of the thirties was close to it. After the decline in 1932 the export increased again – as mentioned before –, the number of exported animals attained then surpassed the average export level of the late twenties. Cattle was particularly sought after on the European markets where in the thirties it was beyond competition, and due to the military preparations its market considerably widened. Initially 70–80 per cent of the export consisted of beef cattle, after the crisis, however, its share in the exports decreased in favour of lean or semi-fattened animals; between 1933 and 1938 the export of fattened cattle fell to about 30 per cent of the total export. The bulk of pig exports, on the other hand, continued to consist of fattened pigs.

There were less exports of horse and sheep and their trends seem to have developed along opposed lines. While the number of horses exported was the highest in 1929 and fell from an average of 10 000 in the twenties to 5 000–5500 after 1933, the export of sheep decreased in the twenties, from 45 thousand in 1925 to 16 thousand by 1928. The crisis started in this field with increased exports, mainly to Switzerland and Austria; from the thirties it was the export to France that increased(11). It ranged from 84 to 55 thousand between 1930 and 1933, and from 35 to 39 thousand in the second half of the thirties. The years of the crisis thus brought a quantitative upswing. The exports of draught and slaughter animals

were promoted in the thirties by the fact that the prices of animals fell to a lower level than the grain and flour prices, so the export was relatively feasible.

A component of the agricultural export, incomparable in its proportions to those discussed above, but unparalleled concerning the rate of its development, was the export of *poultry products*. With all products of the poultry branch taken into account, this item made up 10 per cent of the total agricultural exports in 1925. This proportion grew in a couple of years to 12 per cent and remained at this level. Under the influence of the crisis, but mainly in the period following it, the share of poultry products in the export continued to increase, reaching 19·34 per cent in 1931 and about 18 per cent in 1934; then it declined again over several years and settled around 14·5 per cent at the end of the thirties.

All these trends reflect, in fact, a considerable progress, as the post-war area of Hungary exported in the second half of the period in question *more poultry* than the entire pre-war territory of Hungary before the First World War. Naturally, the preconditions were given, since the bulk of the pre-war poultry export too had come from the presen area of the country. Yet, the efforts were remarkable.

The export – of considerable volume even in 1925 – continued to grow, mainly in live and slaughter poultry as well as in feather. The egg export will not be analysed since it depended, in fact, on the export capacities of other countries (first of all Holland), although Hungarian eggs could always be sold on the traditional markets. The slaughter poultry export showed a remarkable increase in an absolute sense too, and this increase continued during the years of the crisis. True, in 1932 some decline occurred, but even then the export volume exceeded the 1925 level by about 50 per cent. After 1933 the export continued to grow; in 1937–38 more than 23 thousand tons of slaughter poultry were regularly exported annually from Hungary, more than 2·5-times as much as in 1925–26 (Table 29).

In the course of this development process the export structure of poultry products underwent a transformation. The export of live poultry – though increasing till 1930 – did not keep pace with the slaughter poultry export. After 1930, the top-year of live poultry exports, an even, relatively rapid decrease took place as a result of which the export of live poultry in 1938 was hardly more than 50 per cent of the 1925 level. Thus the share of live poultry in the export fell from the 22–25 per cent level of the twenties to 6 per cent. This change was by all means advantageous and indicated the only possible way of further development.

The largest part of the exported live and slaughter poultry consisted of hens. A considerable proportion (about 20–40 per cent) of the exported slaughter poultry was goose, and after 1933 the export of duck increased too. The turkey export showed practically hardly any change, it had a reliable outlet in England, while the other kinds of poultry were bought first of all by Austria and Germany (after 1930 Italy too became a buyer of live poultry).

The proportion of live and slaughter poultry to the total poultry export was by and large 45–55 per cent. The export of feather occupied an important place being nearly 25 per cent. Up to 1929 it showed a favourable trend rising from

Table 29. Exports of poultry products between 1925 and 1938(12)

Year	Live poultry	Slaughter poultry	Egg	Feather	Fresh goose liver	Other	Total value
	tons						1000 P
1925	2 839	9 641	14 191	2 386	102	13	68 294
1926	3 656	9 793	16 842	2 469	138	47	87 794
1927	3 851	12 662	14 242	3 031	153	41	89 489
1928	3 651	11 106	8 845	3 041	247	53	81 109
1929	3 147	11 607	7 205	2 964	217	76	82 226
1930	1 930	16 641	13 177	2 235	182	38	83 775
1931	5 164	18 542	11 981	2 547	183	55	76 756
1932	4 780	13 191	6 397	1 780	228	38	37 064
1933	4 170	19 049	11 516	2 569	272	37	46 457
1934	3 146	23 797	9 506	3 541	255	62	51 966
1935	2 767	22 577	8 256	2 598	330	285	47 110
1936	2 605	17 987	6 911	2 811	419	145	40 690
1937	2 797	23 310	11 454	3 180	497	310	55 687
1938	1 570	23 633	14 083	2 553	443	364	52 418
Average of 1925–1938	3 551	16 681	11 045	2 700	262	112	64 345

2 300 to 3 000 tons. Then it came to a sudden standstill due to the crisis, but after 1933 again showed the earlier volume, and from then on – though with rather great fluctuations – the export grew, that is, its average was above the level of the twenties. The export of goose liver too showed a similarly fast rate of increase which was not substantially checked even by the crisis. By the end of the thirties it was more than four times as high as it had been in 1925. The increase in egg export exceeded 20 per cent, although the rather great fluctuations make a generalization difficult. In the whole poultry and poultry product export it was conspicuous that the volume of exported products attained or even exceeded almost in all fields the amount exported from the entire pre-war territory of Hungary before 1914. This fact reflects the large-scale development of poultry breeding and the relatively rapid increase of productivity, which later will be discussed in some detail.

The export of lard and bacon was of considerable extent too. In the early twenties Hungary was dependent on imports of these products, but in 1926 they already represented 4·55 per cent of the total agricultural export. In the late twenties the export showed a sharp decrease which – and the stagnation of the export on a low level – lasted until 1933. Then the opening of the German market increased the exports, which attained first 5·65, then, in 1936, 9·13 per cent of the total agricultural export. In subsequent years it fell back again to 5 per cent or so, but by the end of the thirties the volume of exports significantly exceeded the level of the twenties.

If we examine the data of export statistics for the different periods we have to notice that the crisis caused a radical change in the structure of export. There were products for which the outlets – except for certain years – were not reduced, only

the prices decreased at the most, as e.g. in the case of cereals, maize, legumes, oil seeds and tobacco. On the other hand, the exports of other products were seriously affected by the crisis, even the volumes were cut down, as was the case e.g. with fruit and vegetables, potato, wine and some products of food industry (flour, sugar). These products were charged by the importing countries with so high tariffs – or their import was prohibited – that the export could not be increased either by high premiums or in any other artificial way. In certain cases, on the other hand, the export level could be maintained, or even the exported volumes increased by various measures taken. In the case of paprika, medicinal plants, malt, lard and bacon, butter, eggs and feather, clover seeds, this method had a favourable influence on export(13). In another group of products export decreased because the government, under the influence of the crisis, persuaded the industry to process the domestic raw materials. This was the case with raw hide and wool, exports of which were anyway on the verge of failure(14).

The disintegration of the Monarchy created a new situation for the export. The earlier established conditions of an international labour division determined, though, the trend and composition of export for long years ahead, but this did not provide the same protection as earlier the unified customs area of the Monarchy. In fact, the opposed tendencies soon developed in all successor states. The development of industry in Hungary interfered with the interests of the Austrian and Bohemian industries, at the same time Austria and Czechoslovakia tried to protect their agriculture, and the independent customs area provided better possibilities for all this. These tendencies became more intensive after 1929 when the crisis increased the differences which earlier had possibly been concealed or which would have been smoothed out under more balanced conditions. Owing to the fewer traditional export markets, mainly Czechoslovakia, Hungary had to find new outlets, in Central Europe and also elsewhere.

More than 60 per cent of the agricultural exports went initially to Austria and Czechoslovakia, the traditional markets of Hungarian agriculture. But as soon as the independent customs area was introduced the volume of commodities exported to other countries of Central and Western Europe became much larger than before. However, up to 1931 the mentioned two countries of the former Monarchy remained the most important partners. The export increased considerably to two other countries as well. Agricultural exports to Germany showed a remarkable increase, 10–14 per cent of the exported products found a regular outlet here, and exports to Italy grew likewise (at a faster rate than to Germany); the share of Italy rose from 3·6 to 8 per cent by 1929, and to 16 per cent by 1930. Exports to Switzerland, France, Great Britain showed a similar increase. However, until the beginning of the world crisis the traditional export markets did not, in fact, change, the bulk of exports was placed on the area of the former Monarchy and only a smaller part on traditional markets outside the Monarchy. The situation can be much better characterized by taking some major export goods into consideration. Thus, 73–86 per cent of the wheat exports, 75–95 per cent of the rye exports, 54–74 percent of the barley exports, 84–98 per cent of the oat exports,

90–96 per cent of the maize exports, 74–92 per cent of the flour exports, 70–82 per cent of the cattle and 96–99 per cent of the pig exports were placed on markets in Austria and Czechoslovakia.

The world crisis radically changed this situation. The modification carried out, in fact, gradually and in various forms, in a few years almost totally upset the former situation. The Czechoslovakian and Hungarian tariff war and the resulting rapid decline of exports to Czechoslovakia represented one of the components of the change. While in 1930 Czechoslovakia absorbed 20·8 per cent of the total agricultural export of Hungary, by the next year this proportion fell to 4·1 per cent, and even if the situation improved later compared to this level, the proportion of exports to Czechoslovakia never again exceeded 8·7 per cent; and even this figure gives a false impression, because from the middle of the thirties exports to Czechoslovakia did not make up more than 4–4·5 per cent of the total export on an average. This meant serious difficulties for Hungarian export, which Hungary partly never managed to eliminate, partly they were of the kind which could not be eliminated (e.g. subsequent pig exports always missed the amount exported earlier to Czechoslovakia). Exports to Austria decreased likewise, due mainly to the measures taken by the Austrian government to protect the agriculture of Austria.

These disadvantages could be lessened, however, by concluding various contracts. It was the loss of the Czechoslovakian market in the first place that compelled the foreign trade of Hungary to look for other outlets. The new market was found partly in Italy, partly in Germany. Exports to Italy were generally above 10 per cent after 1934, and between 15 and 17 per cent after 1935. The German market exercised a much greater attraction than the Italian market. With Hitler having come into power Germany encouraged the export of South-Eastern European agricultural products partly for political, partly for financial reasons, which at the beginning seemed economically advantageous for these countries too. The share of Germany from the agricultural exports of Hungary

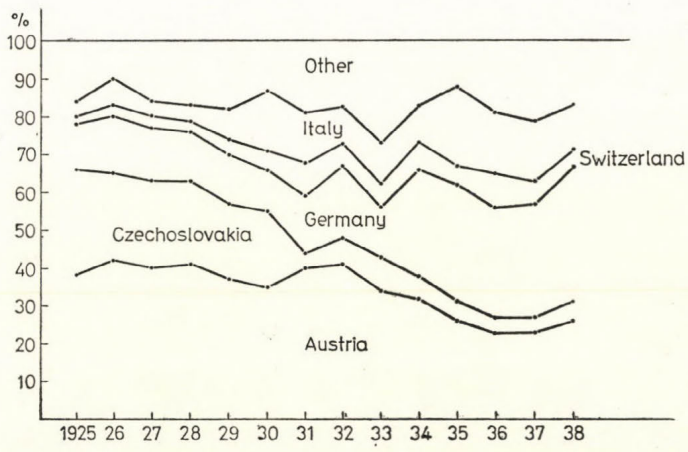


Fig. 23. Distribution of agricultural exports among countries, 1924–1938

rapidly increased after 1933; while in 1931 it was only 14·5 per cent, in 1932 rose already to 18·2 and in 1934 to 28·8 per cent, then regularly was above 30 per cent. And when with the annexation of Austria the German Empire extended to the Hungarian border, its share from the Hungarian agricultural exports increased to more than 60 per cent (whereby Germany was able to exercise an influence on the economic – and through it political – life of Hungary)(15). In addition, from 1934 Germany ensured a price much higher than the world market price for Hungarian exports through clearing agreements, increasing thereby the economic dependence of Hungary, since – as the other side of the agreements – a considerable part of the industrial imports of Hungary was reserved for German industrial goods. (Returns from agricultural exports could only be utilized by purchasing goods from Germany.) Thus the traditional labour division of the Monarchy seemed to have been replaced by a quite different type of labour division, that of German industry and Hungarian agriculture which – even if it could not be of long duration being born of a fundamentally militarist political conception – meant great possibilities – and problems – for economic life in Hungary.

The world crisis had another, similarly important consequence: the division of the international financial system into countries with convertible and inconvertible currencies. The traditional Hungarian agricultural export oriented in the thirties to Germany and Italy was, in fact, effectuated with these countries through clearing agreements, so it became of vital importance for Hungary – first of all for financial, later, of course, for political reasons too – to increase its exports to countries which earlier had not bought larger volumes of Hungarian agricultural products, but since they paid in convertible currency were of great interest for Hungary(16). Great Britain e.g. had an average share of 1–3 per cent from the total Hungarian agricultural export in the twenties, which increased to 6·6–7·2 per cent in the second half of the thirties; the share of the United States increased likewise, from 0·2–0·9 per cent in the twenties to 2·9–3·3 per cent by 1936–37. Exports to France grew similarly, from 0·3–1·1 to 5·5–7·3 per cent during the thirties. The Government encouraged the exports to these countries with various preferences – premium, etc. – granted, since it could obtain convertible currencies by them. This had a political role too; Hungary tried to lessen its dependence on Germany economically, and thereby politically too. These efforts naturally faced failure from the beginning; through its economic structure Hungary was at the mercy of the German market, and with the large Western European countries could only establish one-sided relations, since it could not compete with the cheap overseas foodstuffs and raw materials. There were, however, some commodities of which exports to these countries could be increased for a while, e.g. poultry, wine, cheese, seeds, fruit, canned products, etc.

As a consequence of the above, the transporting distance of the exported products, i.e. the export radius, grew considerably, not only because of increased exports to Western European and overseas countries, since in this respect no significant differences occurred, but also because in place of areas of the former Monarchy exports were concentrated in new areas (Germany). In the first half of the twenties

the average export distance was only about 400 km. Between 1925 and 1927 this distance was already 510 km, and in the middle of the thirties came close to 1000 km(17). Characteristically, the exports to the area of the former Monarchy – though increasing until 1929 – gradually decreased in proportions. With Germany and Italy joining in the exports the costs of input essentially grew, as the transporting costs increased. The higher transport charges in turn increased the production costs (which were anyway relatively high compared to those in the larger exporter countries), and decreased the competitiveness and the producers' profit from the export(18).

Notes

(1) Literature on the autarchic tendencies after the First World War has recently been increasing. According to the Austrian historiographic works Hungary and the high Hungarian industrial tariffs were responsible for the disintegration of the customs union. See E. Lagler: op. cit. 416.
(2) For the export restrictions and their abolishment see J. Buzás: Foreign trade of Hungary between 1919 and 1938. In: "Magyarország külkereskedelme 1919–1945" (Foreign trade of Hungary 1919–1945). Budapest, 1961. 10–18, and N. Csáki–B. Szitó: Magyarország mezőgazdasági kivitele (Agricultural exports of Hungary). Budapest, 1963. 6. For the wheat export see Milhoffer: A magyar búza és értékesítése (Hungarian wheat and its marketing). Budapest, n. d. 111.
(3) On the basis of the 1925–1938 volumes of the statistical series on the foreign trade of Hungary (Magyar Statisztikai Közlemények. New series). Our calculations slightly deviate from those presented in N. Csáki–B. Szitó: op. cit. 7. See further: Magyar Statisztikai Szemle, 1938. 467.
(4) On the basis of the volumes of "Magyarország külkereskedelmi forgalma" (Foreign trade of Hungary).
(5) For the foreign trade agreements see Buzás: op. cit., Csáki–Szitó: op. cit. 6.
(6) Csáki–Szitó: op. cit. 9–12.
(7) For the question see among others: Buzás: op. cit. 18–30. Recently Berend–Ránki: op. cit. 157 et sqq.
(8) Csáki–Szitó: op. cit. 18.
(9) On the basis of data in the volumes of "Magyarország külkereskedelmi forgalma" (Foreign trade of Hungary).
(10) Csáki–Szitó: op. cit. 22.
(11) For sheep exports to Greece, Czechoslovakia and France between 1932 and 1935 see further: OMK 1935. 165.
(12) Csáki–Szitó: op. cit. 23 (slightly modified data).
(13) For the respective measures detailed information is given in Szuhay: op. cit.
(14) Szuhay: op. cit. 229–243.
(15) Csáki–Szitó: op. cit. 232. On the basis of the corresponding volumes of "Magyarország külkereskedelmi forgalma" (Foreign trade of Hungary). For the changes of export trends between 1929 and 1938 see: OMK 1938. 100–115 and Magyar Statisztikai Szemle, 1938. 478–479.
(16) Discussed in detail by Szuhay: op. cit. 176–181.
(17) Csáki–Szitó: op. cit. 34–39. In Buzás: op. cit. These changes are underestimated (53 et sqq.), namely his twenty year averages make this very change invisible.
(18) For example if the export radius of wheat increased, its domestic price decreased. Szarka: op. cit. 13.

Part III

Chapter 8 Animal husbandry between 1919 and 1938

Prior to making a survey of the trends in animal husbandry for each branch separately, then of the structural changes in the livestock in the inter-war period, it would be desirable to summarize briefly the general correlations that determined the trend of development. We must repeatedly emphasize that it was the changed external and internal conditions of the new country that determined the possibilities, trends and peculiarities of development.

The territorial changes, as a consequence of the conclusion of peace altered the former traditional proportions shaped by centuries, but – along with the accelerated rate of capitalist development – were slowly changing themselves. Any change occurring before 1919 affected the entire Monarchy, but by all means the territory of historical Hungary as an integral whole. So it was particularly the results of a regional specialization in the second half of the 19th and at the beginning of the 20th century that the territorial changes destroyed following the conclusion of peace. And since between the so-called successor states and Hungary no closer economic co-operation could be imagined, upsetting the traditional balance meant a great shock to livestock husbandry on the area left to Hungary. We have already spoken of the differences in the structure of livestock husbandry, it is not worth repeating them here. No doubt, however, that livestock husbandry was much more reactive to the changes than crop growing.

However, it should be pointed out that when examining the effects of territorial changes we had to use the data of the 1911 registration of animals providing the best possibilities for a multilateral analysis. However, from 1911 to 1922, from when spring registrations of useful animals were available again, more than ten years had elapsed during which period the position of livestock husbandry, a branch more reactive to any change in the economic conditions than crop production, had undergone considerable changes. One of the factors that must be taken into consideration here is that 1911 was the very peak of the economic upswing which had begun after 1906, the statistical survey fixed thus a moment in the transformation of livestock husbandry when favourable changes were already at a rather advanced stage. In addition, in the mentioned decade there were nearly five war years, and under the extraordinary conditions of war livestock husbandry was exposed to much greater changes than crop production. The horse stock was placed at the disposal of the army, the cattle and pig stocks were utilized to a greater extent in supplying the population, but primarily the army with food, and the sheep stock too was affected by an increased interest in wool production. Inflation that unavoidably came to pass during the war also had an impact on

livestock husbandry, resulting in an increased tendency to make investments and in a growing interest in livestock husbandry, which manifested itself in the increasing number of cattle and pigs in 1915–1917. The last two years of the war (1917–18) were, on the other hand, characterized by the using up of capital, a tendency of decreasing rather than increasing the stock. This tendency was enhanced by the revolutionary events in 1918–1919, then by the inevitable damages of the subsequent occupation, which contributed likewise to reductions in the livestock.

It is obvious from all this that after 1919 Hungary was far from having the number of livestock calculated on the basis of the 1911 registration; in some animal species the actual number was much lower, while in others higher than that.

There are no official data available, but in 1919–1920 the number of horses was at least 20 per cent lower than in 1911. Losses in the sheep stock of the country were likewise heavy, much heavier, indeed, not only on account of the war but also, and perhaps mainly, from the revolution and occupation in 1918–1919 – since a very large proportion of the sheep stock, compared to the other animal species, was owned by large estates which generally were hard hit by the revolution and occupation. The loss of the sheep stock was at least 45, if not 50 per cent. The cattle stock, on the other hand, mostly owned by peasants was not hard hit by the war as regards its numbers. Some reduction may have occurred in the oxen but the stock as a whole even increased by 1920, as a result of the accelerated inflation after the war.

To assess the losses in the pig stock is a more difficult task. They may have been much greater than recorded, but such important sources of error have to be taken into account that it is very difficult to draw any conclusion. The revolutionary events obviously influenced the pig stocks of large estates too, where the losses were considerable, but the overall loss cannot have been more than 15–20 per cent. And pig breeding – alone among the livestock branches discussed so far – must have recovered in a relatively short time, 1–3 years; the exact time depended on the maize yields and the price level.

In the poultry stock the loss may not have been significant, as it was hardly affected by the territorial changes, while the war conditions even promoted the development of the stock. Before 1919 no labour division in poultry breeding had developed between the different regions of Hungary, and most districts producing larger surpluses fell within the new frontiers. All these are, of course, mere deductions, since there are great intervals between the years from which reliable data are available and which in the case of poultry may invalidate any possible conclusion. Nevertheless, all known data have led us to the above results.

To be able to understand the effect the disintegration of the Monarchy and the new frontiers had on the livestock we have to consider the data contained in Table 30. The cattle stock no longer attained the level of 1911 except in the first few years after the war, and even the pig stock only came close to it in certain years like 1921, 1935 and 1938, generally remaining far below the 1911 level. The decrease in the sheep stock was a long extensive process, while that of the horse stock was, in fact, insignificant. At the peak of the boom the number of horses

Year	Cattle	Horse	Pig	Sheep
1911*	2150	896	3322	2406
1920	2663	738	2873	1401
1921	2197	748	3226	1489
1922	1827	717	2743	1352
1923	1819	815	2133	1587
1924	1893	850	2458	1813
1925	1920	876	2633	1890
1926	1847	885	2520	1804
1927	1805	903	2387	1611
1928	1812	918	2661	1566
1929	1819	892	2582	1573
1930	1785	860	2362	1464
1931	1814	864	2715	1440
1932	1819	845	2361	1210
1933	1698	820	1899	1058
1934	1678	803	2502	1087
1935	1755	804	3176	1227
1936	1742	794	2554	1350
1937	1756	798	2623	1484
1938	1882	813	3110	1629

Table 30. The number of livestock according to the spring registrations of useful animals (1000 animals) (1922–1938) (1)

* Data of 1911 related to the new territory of Hungary

exceeded the pre-war level of the present area of Hungary. Naturally, the latter was only a temporary phenomenon, and the gradual reduction of the horse stock that occurred all over the world as a result of increased mechanization appeared as an irreversible tendency in Hungary too, although the quite extensive system of farming here considerably slowed down this process. According to Hungarian historiography, the "Prussian course" of the capitalist development of agriculture alone was responsible, which was characterized in Hungary too by the survival of latifundia of feudal origin. In our opinion this was not the only cause, it would be a mistake to regard the reduction of livestock in the twenties and thirties as a manifestation of the "Prussian course" of agricultural development. The reduced number of livestock was an inevitable consequence of the difficulties in placing commodities on the markets of the former Monarchy and of the prices which had fallen to the world market level(2). The cattle and pig stock were particularly slow in getting over the difficulties caused by the restriction of market possibilities, reduction of prices and breaking up of traditional production relations. On the present area of the country, in the central part of the former Hungary, animal rearing and husbandry was the main line of the livestock sector, and this possibility which e.g. in the case of pig farming had partly been based on the fodder surpluses of border areas, was considerably restricted after the conclusion of peace. The pressure of the world market was obvious for in the twenties, at the time of the boom, the price of animals did not rise sufficiently, or more precisely, the price of grain crops showed a higher rate increase than of animals and livestock products, and so the attraction of prices – especially in the first part of the period – was less

effective here. Under such conditions any increase in the number of livestock could have hardly been expected. Stagnation *in this respect* became a historical necessity.

Nevertheless, these data reflect a comparatively rapid process of regeneration. The general prohibition on slaughter which was in effect until 1922 and concerned the cows and female sheep(3), the decreased exports, and perhaps in the first place the favourable effect of inflation resulted very soon in an increase in the livestock, which in cattle exceeded in 1920, and in pig approximated in 1921, the level of 1911. This progress was facilitated by high fodder yields in 1920. That these data – at least in their tendency – are rather reliable is shown by the fact that the horse and sheep stock were still behind the 1911 level. From all this we can draw the conclusion that there were attempts made – and not without any result at that – to increase the livestock as soon as possible. The farm conditions too were a warning, since due to the land reform in 1920 there was an increased demand for draught power, but the growth of the livestock was facilitated by the favourable economic situation as well.

This early upswing could not, however, be maintained. That how much the size of the livestock was determined by fodder yields is shown by the fact that the livestock reacted by a quick reduction to the poor fodder yields of 1921, and so everything built up earlier was lost in a year. Between 1922 and 1925 the livestock reached, in fact, a maximum (except the horse stock which was at its peak only by 1928) that it never again exceeded. This was, however, far behind the 1911 level. The given possibilities of the country, the foreign trade situation, i.e. the loss of outlets and mainly the reduced export prices simply prevented the growth of the livestock either through the extension of fodder crop growing or by increased fodder imports. In the absence of the earlier favourable marketing possibilities Hungary was unable to maintain the animals of the 1911 livestock falling within the new area of the country.

When regarding the period between 1920 and 1938 as an independent unit we find that by 1925 the livestock roughly attained the density the given economic possibilities of the country permitted. Nevertheless, the livestock number of 1925 – which in cattle and sheep meant a peak in the period examined – remained considerably below the 1911 level. The same density was attained by the pig and horse stock at different times, but this cannot essentially influence our conclusions as the pig stock – which is the most responsive of all animals to any change in economic conditions – can be easily and quickly increased, while the horse stock, as one of the bases of farming (draught power), showed a rather steady density throughout the whole period. Under the Hungarian conditions cattle requires the greatest attention, as it is the animal that most characteristically determines the livestock breeding of the country.

The data of Table 30 are suitable for drawing some general conclusions on livestock husbandry as a whole. The large cattle stock of the first years of peace rapidly decreased after the first poor fodder yields, and mainly when prohibition on slaughtering had been lifted. In the case of other animals regeneration started

from a level lower than that in 1911. The first peaceful years were undoubtedly the basic period of reconstruction, which can be followed approximately to 1925. During this period the fodder yields generally were good or satisfactory, the marketing possibilities improved too, the prices slightly rose. The growth of the livestock (except a decline in the number of cattle in 1922–1923) was thus rather undisturbed until 1925. The next period – from 1926 to 1931 – was that of a slow decline, then stagnation; and although according to our data the marketing possibilities too were reduced to some extent, it was not this but a series of poor fodder yields that accounted for a decrease in the livestock. The higher feed prices increased the prime cost of livestock breeding, and since the marketing prices could not compensate for it there was a reduction in the livestock. The first two or three years of the period were characterized by a decline, replaced later by a stagnation in 1929–1930.

The devastating wave of the economic world crisis reached the livestock breeding of Hungary in 1931–1932. Under its influence the more reactive components of the livestock (cattle, pig, sheep) showed a rapid decrease, although this was far from uniform in rate or extent. The effect of a fall in prices was even more serious on account of the poor fodder yield of 1931, increasing the number of animals to be sold.

The period of crisis which lasted to 1934–1935 was followed again by an increase in the livestock. This was promoted also by the high fodder yields which were mostly above average in those years (although in 1935 e.g. the maize yield was catastrophically poor). The period as a whole was characterized again by a slow increase. This change did not upset the given frames, and the livestock – though sometimes coming close to the 1911 level – remained always far below it.

The development periods, or cycle, of livestock breeding somewhat differed from that of agriculture and of economy in general. This had two causes: the different trend of prices, and the fact that in Hungary the situation of the livestock – with prices permanently unfavourable compared to earlier decades – was in essentials determined by the fodder yields. A single example will suffice to prove this statement. The relatively favourable economic conditions in the second half of the twenties were not, in fact, sufficiently utilized by the livestock sector. An upswing started after 1924 when in Hungary the number of animals decreased or stagnated. And for this the fodder yields were responsible. Of the fifteen years between 1924 and 1938 the feed balance of Hungary was negative in eight and positive in seven years. However, five of the eight negative years fell within the period of 1924–1930 while between 1930 and 1938 there were six years with a positive feed balance! It had a significant effect on the whole livestock and in many respects determined the periods of development too. That was the reason why in the period of boom, before 1930, the livestock fell back, while during the world crisis the decrease was not of such an extent as expected. Another typical case: as a response to catastrophic yields of roughage and grain fodder crops in 1935 – the worst in the whole period – especially the pig stock was considerably reduced by 1936. In the case of pigs a definite tendency to selling off can be spoken of,

although by that time relatively favourable economic conditions developed which would have suggested just the opposite tendency occurring. The favourable economic conditions seldom coincided with the high fodder yields, as e.g. between 1936 and 1938 when the possibilities could be fully exploited.

All this does not mean that the influence of the economic cycles was not felt, only it was softened, distorted, modified and showed up with some delay in livestock breeding. All this points to the fact that the low number of livestock was a consequence of poor fodder yields. The excess fodder crops of border areas which before 1914 had met the requirements of livestock breeding could not be utilized after 1919. Fodders could have been imported, of course, but this was not permitted by the foreign trade balance of the country, because the export prices of animals and livestock products were not so favourable even in the prosperous second half of the twenties as to make a regular, large volume import profitable. Increased utilization of arables for fodder growing began only during the economic crisis; between 1920 and 1938 price conditions were more favourable for grain crops which demanded a lower input. This was in the first place the reason why the number of livestock did not increase, but decreased or stagnated. Thus, on the new area of the country the livestock became fewer in number, although the general level of Hungarian agriculture would have required an increase in the entire livestock, and particularly in the number of cattle, if only to increase the amount of farmyard manure. This, however, did not eventuate, and the decrease in the livestock was even shown in the reduced quantities of farmyard manure, too. By a rough calculation it was only in every seven years that 275 q farmyard manure could be used for one hectare arable in Hungary(4). The lower animal density is indicated also by the fact that while the present area of the country had 73·3 standard animals per 100 ha before 1918, this figure was only 70·4 after 1925(5).

Thus – as seen above – the pre-war number of animals could not be maintained due to unfavourable changes in the marketing conditions. This meant, on the other hand, that it became much more important both for the economy of the country and the individual producers to increase the output per animal. Thus it was a qualitative rather than quantitative improvement that characterized livestock husbandry – and within it the development of animal species and breeds – in the period examined; the farmers tried to achieve higher outputs with the reduced number of livestock. For this very reason in the subsequent detailed analysis increased attention has to be paid to the different kinds of qualitative development.

It would not do any harm to clarify what we understand by "quality". What did qualitative development mean in the period concerned? In Hungary in the last century, and even at the turn of the century fine conformation, larger body and higher weight were the general determinants of quality. Not that even then priority was given to the aspects of production, heredity, resistance, feed conversion, etc. over the external characters, but in general the exterior remained the dominant feature. It was highly characteristic of the contemporary Hungarian view that the breeding of a stock was decided first of all on the basis of exterior, then

according to site of origin. The insistence on keeping the Simmenthal breed of Bern at any price, in many cases at the expense of Hungarian local breeds and even more so of other western breeds, can be explained by the mentioned view. The overestimation of the exterior, the competition between landowners in the external appearance of their animals was in every respect disadvantageous to peasant small holders, as this view did not change even when hundreds of villages proved the superiority of certain Hungarian local breeds in milk and meat production to the pure Simmenthal breed which – and that was the real absurdity of the Hungarian situation – was then no longer considered a first class breed even in Switzerland! It was only from the turn of the century, and mainly after the First World War that increased attention was paid to the inner characteristics of animals: high productivity, favourable feed conversion rate, proper transmitting ability, uniform stock, resistance, relatively long life, satisfactory results in breeding and progeny rearing, and not in the least the possibility of multipurpose utilization. All this naturally did not mean either the negligence or the overcompensation of outer appearance, and it was in that period that by the term "qualitative development" progress made in the field of productivity, higher yields, better quality products were first understood. It was then realized that the same breed – if widely introduced – made the whole stock more valuable, and thus meant in itself a qualitative progress(6).

Accordingly, qualitative progress means that within a livestock branch breeds of a higher economic efficiency (better feed conversion, higher yields, more and higher quality milk, wool, etc.), and within this a more favourable age and sex distribution become dominant. More careful selection of breeding animals, the problems of sire supply too belong here. And the subject of qualitative development includes – in our opinion – the rational changes in feeding which are obviously involved in the improved quality of the stock. These aspects are thus to be kept in view in the following.

Notes

(1) The spring registration data of useful animals are published in the Hungarian Statistical Year-Books, the volumes of "Magyarország földművelésügye" (Agriculture of Hungary), and in a summarized form in the annual OMK reports (see OMK 1938. 79). We completed these data and compared them with the annual summarizations of registrations found in the documents of the Ministry of Agriculture (O. L. F. M. Állatösszeírások statisztikai lapjai). The annual totals are published in: Konkoly-Thege: op. cit. 169 and Mezőgazdasági Adattár, Vol. II (Bp. 1965). See further: National Archives: Preparation of peace.

(2) We note here that an increase in the livestock number does not always mean in itself the favourable position of livestock breeding, since the higher prime cost – as it happened in Hungary too – may have caused diseconomies in livestock breeding. In the inter-war period more than one European country which was in a more favourable position than Hungary, restricted their production of milk or meat by force. For example, Switzerland tried to reduce fodder imports by introducing milk quotas, Denmark and Holland restrict-

ed the number of cattle and pig, Austria and Czechoslovakia likewise decreased the pig stock. That is why a numerical increase cannot be regarded as the only measure of development.

(3) Konkoly-Thege: op. cit. 168.
(4) Idem. 216–217.
(5) Éber: op. cit. 393 taken as the basis of calculations.
(6) This is best formulated in: Konkoly-Thege: op. cit. 229–232 and 239–251.

Chapter 9 Cattle farming

Cattle farming was undoubtedly the most important branch of livestock husbandry not only in itself but also in terms of farming, as its utilization ranged within the widest limits. For this very reason it was rather sensitive to changes in the economic conditions, though at the same time showed stability within the farm. A more detailed analysis will throw light upon these seemingly contradictory tendencies. When examining the numerical trends of the livestock we can hardly speak of anything within this period but a stagnation in livestock at a relatively low level; lower than that of 1911. The livestock – as mentioned before – was the largest in 1920 and then after a rapid decrease it remained roughly at the same level – though with some fluctuations – up to 1932. In 1933 it suddenly dropped and touched bottom in 1934; then it began to rise again and in 1937–1938 reached the earlier level. Of this whole process it is perhaps enough to point to the final results. The annual average of the livestock hardly reached 1·86 million, that is, it fell far below the pre-war level. While at the very beginning of the twenties it exceeded the 1911 average (2·2 million), after 1921 it never again reached it, and only in 1925 did the stock surpass 1·90 million. This was the peak in the inter-war period, if we disregard the early twenties. The livestock declined particularly in the thirties: between 1930 and 1938 the annual average did not even attain 1·77 million, while in the twenties it was slightly over 1·94 million. The latter was, however, only due to the outstanding number of livestock in 1920–1921 (in 1920 it was as high as 2·66 million!). If we take no notice of these two record years, the annual average of the livestock was far behind the given possibilities. With the data of these two years left out of consideration, the average of the livestock between 1922 and 1938 is 1·79 million, while the 1922–1929 average will be 1·82 million.

These data are undoubtedly useful, if only to call attention to the effect of the *serial high fodder* yields in the twenties. The cattle stock in those years exceeded by far that of the thirties. We have already mentioned the effect of fodder yields on the livestock; it is even more accentuated by the data on the cattle stock presented in Table 31. Thus the cycle developed here was quite different from that found in other areas of the economic life. If we considered the averages calculated on the basis of the individual phases of the general cycle (i.e. 1920–1924, 1925–1929, 1930–1934, 1935–1938) we would obtain, in fact, results blurring the tendencies of development. To prove this statement, let us examine these data as well. The 1920–1924 average of 2 080 400 accordingly, gradually would decrease to 1 800 760 between 1925 and 1929, then to 1 758 320 between 1930 and 1934, only to show a slight increase between 1934 and 1938 (to 1 783 850). In this way, a totally false impres-

Table 31. The cattle stock between 1920 and 1938(in 1000 animals)(1)

Year	Total livestock	Young cattle						Total	
		Bull	%	Heifer	%	Steer	%		%
1920	2663·0								
1921	2197·2								
1922	1827·0								
1923	1819·0								
1924	1893·1	70·5	3·8	288·4	15·2	174·9	9·2	532·9	28·2
1925	1920·1	67·8	3·5	289·5	15·1	178·4	9·2	535·7	27·8
1926	1847·0	58·9	3·2	269·2	14·6	170·2	9·2	498·3	27·0
1927	1805·5	59·1	3·3	246·1	13·6	161·9	9·0	467·1	25·9
1928	1811·7	62·4	3·5	255·8	14·1	169·4	9·4	487·6	27·0
1929	1819·4	66·5	3·7	267·9	14·7	174·9	9·6	509·3	28·0
1930	1784·6	65·1	3·7	265·8	14·9	168·3	9·4	499·2	28·0
1931	1813·9	76·3	4·2	293·3	16·2	178·0	9·8	547·7	30·2
1932	1818·8	69·5	3·8	296·9	16·3	200·6	11·0	567·0	31·1
1933	1697·6	44·7	2·6	245·6	14·5	168·1	9·9	458·4	27·0
1934	1677·7	49·8	3·0	340·2	14·3	152·6	9·1	442·6	26·4
1935	1755·5	54·6	3·1	277·7	15·8	172·9	9·8	505·2	28·7
1936	1741·6	44·1	2·5	268·9	15·4	175·5	10·1	488·5	28·0
1937	1756·3	55·3	2·9	261·4	14·9	174·0	9·9	486·7	27·7
1938	1882·0	64·6	3·4	311·4	16·5	208·9	11·1	584·9	31·0

Year	Grey Hungarian	%	Red-spotted	%	Badger-coloured	%	Other cattle breeds	%	Total	Buffalo	%	%
1920												
1921												
1922												
1923												
1924	332·5	17·5	1385·9	73·1	32·8	1·7	136·2	7·2	1884·4	99·5	8·7	0·5
1925	322·9	16·8	1408·5	73·4	29·7	1·5	150·9	7·9	1912·1	99·6	8·0	0·4
1926	305·6	16·6	1377·2	74·5	28·1	1·5	128·1	7·0	1839·4	99·6	8·0	0·4
1927	293·4	16·3	1334·7	73·9	29·4	1·6	141·0	7·8	1798·6	99·6	6·9	0·4
1928	286·2	15·8	1343·0	74·1	27·1	1·5	148·4	8·2	1804·6	99·6	7·1	0·4
1929	269·6	15·9	1352·6	74·4	26·5	1·5	143·7	7·9	1812·4	99·6	7·0	0·4
1930	270·5	15·2	1342·3	75·2	26·5	1·5	138·6	7·9	1777·9	99·6	6·7	0·4
1931	256·4	14·1	1349·6	76·9	23·9	1·3	132·5	7·3	1807·4	99·6	6·5	0·4
1932	252·2	13·9	1384·2	76·1	20·8	1·1	155·7	8·6	1812·9	99·7	5·9	0·3
1933	236·9	14·0	1286·7	75·8	19·1	1·1	147·0	8·7	1690·8	99·6	6·8	0·4
1934	216·5	13·9	1298·2	77·4	17·1	1·0	140·1	8·4	1671·9	99·6	5·8	0·4
1935	220·3	12·5	1367·2	77·9	19·4	1·1	142·1	8·1	1749·0	99·6	6·5	0·4
1936	217·5	12·5	1324·0	76·0	18·1	1·0	174·7	10·0	1734·3	99·6	7·3	0·4
1937	211·4	12·0	1362·3	77·6	16·4	0·9	159·5	9·1	1749·6	99·6	6·7	0·4
1938	216·8	11·5	1477·2	78·5	17·8	1·0	162·9	8·7	1874·7	99·6	7·3	0·4

sion would be obtained, as the above generalization would conceal the great decline in the years 1933–1934, and even the modifications at different rates taking place in the twenties would fade into a uniform slow decrease.

Year	Fully developed cattle		Heifer above two years						Total	
	Bull	%		%	Cow	%	Ox	%		%
1920										
1921										
1922					940·0					
1923					876·0					
1924	23·0	1·2	135·4	7·1	891·6	47·0	313·1	16·5	1363·1	71·8
1925	24·0	1·3	158·8	8·3	903·5	47·1	298·1	15·5	1377·4	72·2
1926	23·2	1·3	146·4	7·9	900·9	48·7	278·2	15·1	1348·7	73·0
1927	23·4	1·3	141·0	7·8	908·4	50·3	265·6	14·7	1338·4	74·1
1928	23·7	1·3	142·4	7·9	908·3	50·1	249·6	13·8	1324·0	73·0
1929	24·2	1·3	141·2	7·8	915·2	50·3	229·4	12·6	1310·0	72·0
1930	24·3	1·4	143·7	8·1	906·4	50·8	211·1	11·8	1285·5	72·0
1931	26·6	1·5	143·4	7·9	904·2	49·8	192·1	10·6	1266·3	69·8
1932	25·4	1·4	141·3	7·8	907·6	49·9	177·5	9·8	1251·8	68·9
1933	22·7	1·3	137·9	8·1	903·8	53·3	173·8	10·2	1238·0	73·0
1934	22·0	1·3	138·6	8·3	903·2	53·8	171·3	10·2	1235·0	73·6
1935	23·8	1·3	141·8	8·1	913·7	52·1	171·1	9·8	1250·3	71·3
1936	22·3	1·3	151·3	8·7	901·2	51·7	178·4	10·2	1253·2	72·0
1937	21·9	1·2	158·8	9·1	900·3	51·3	188·7	10·7	1269·7	72·3
1938	23·7	1·3	165·2	8·8	917·3	48·7	191·0	10·2	1297·2	69·0

With the above data it is also possible to study how separate parts of the cattle stock react to changes in the whole stock. The first, and perhaps most important point to be taken into consideration is that although the ratio of fully grown and young animals ranges from 68·9 to 74·1 and from 31·1 to 25·9 per cent, respectively, the decisive part of fluctuations in the number of the total livestock – nearly all *fluctuations – occur in the young stock*. The cattle stock considered fully grown (including young animals over two years of age first of all young heifers) exhibits a surprising steadiness, especially the number of cows and fully grown bulls, but even the fluctuation in heifers older than two, remains below the average measure of fluctuation in the young stock. Thus, the effects of the changing economic conditions were first felt in the number of young animals. Under favourable price conditions, with high fodder yields, first the number of young animals was increased, and only if the situation proved steady could there be any considerable growth of the cow stock. Under adverse conditions, with low fodder yields, the breeding stock, mainly the bulls and cows that ensured the maintenance of breeding was preserved. This applies to the more than two-year-old heifers too which were apparently ranked with the cows and treated in every respect by the breeders as an immediate reserve. (From this point of view it was highly unfavourable for the whole period that half of the newborn calves were slaughtered!)

From all this we can draw the conclusion that it is at the time of economic depression that the proportion of fully grown animals – cows and heifers above two – to the total number of livestock increases, and when the economic situation is favourable for cattle breeding, it decreases. This is indeed what the experience, and also the data prove, as the proportion of the cow stock was the highest in

1933–34 (53·3 and 53·8 per cent of the whole stock), while in the twenties, and particularly before 1926, it was much lower, about 47–49 per cent. With the improved economic conditions at the end of the thirties the proportion of the cow stock decreased again, to 48·7 per cent in 1938.

With some exaggeration we may say that from the trend of the percentage of cows and heifers older than two, we can assess the situation of cattle breeding. And if this statement is accepted we can, actually, realize an unfavourable situation from 1927 already from the fact that, compared to previous years, the proportion of cows suddenly rose, exceeding by fifty per cent the whole cattle stock. It fell below this level only in 1931–1932 (if the 0·1 per cent by which it was below 50 per

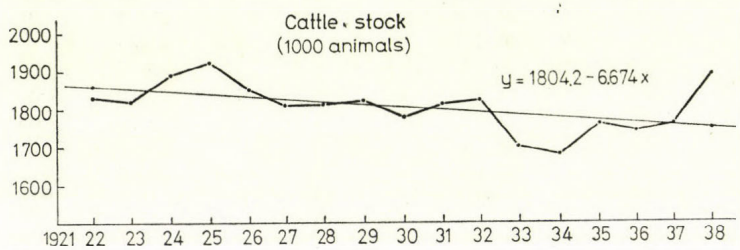


Fig. 24. Trend of the cattle stock, 1922–1938

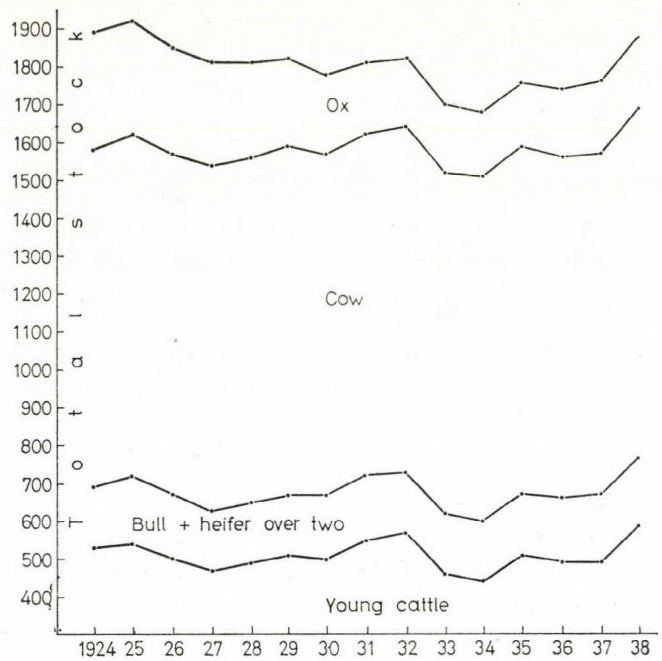


Fig. 25. Structure of the cattle stock, 1922–1938

cent can be regarded as a fall at all), then suddenly rose above 53 per cent only to decrease slowly to 51·3 per cent by 1937. The sudden improvement occurred in 1938, that is, it was then that it became obvious. In 1938 the proportion of the cow stock dropped to 48·7 per cent, an unexampled low level, which coincided with a rapid increase in the number of young animals. In short, the proportion of the cow stock reflects more reliably the economic situation, and gives a more realistic picture in this respect than the numerical trend of the total cattle stock.

The ratio of bulls to the total number of fully grown cattle was roughly constant, about 1·3 per cent, and their number changed parallel with that of the whole stock. The economic situation – quite logically – had hardly any influence on this part of the cattle stock. The number of bulls was, in essentials, regulated with the maintenance and reproduction of the stock in view, that is, by the demands of breeding. With respect to fully-grown oxen, however, their number and proportion in the total stock too, showed a gradual decrease. However, the decrease in their numbers from more than 310 thousand to about 170 thousand was not connected with the changes in the economic situation of cattle breeding, it reflected a tendency felt in the whole of agriculture and characterized by the increased predominance of the horse as a draught animal, and the introduction of the tractor. The number of oxen decreased quite evenly until 1935, then between 1936 and 1938 rise slightly, and so did its proportion within the total livestock. This did not change the general tendency, namely, that in 1935 the total stock of oxen was 54·64 per cent, and even in 1938 only 61 per cent of the 1924 figure. And if the data of the early twenties were available, the decrease would appear even more significant.

All this is confirmed by the examination of the young stock. Changes in the stock of young cattle, and especially in the number of heifers, gives a realistic estimate of the economic situation. The stock was the lowest in 1934 in both number and proportion, although the latter in itself does not fully reflect the changes, since in 1938, at the time of the highest stock number, it was only 31 per cent, while earlier, with the much lower number of 567 thousand, exceeded this level by 0·1 per cent. The highest influence on the numerical trend of the total cattle stock was undoubtedly exercised by the young animals, mainly heifers. The number of heifers was the largest in 1924–1925, 1931–1932 and 1938 (for the period 1920–1924 no relevant data are available); the number of more than 311 thousand in 1938 forecasted a further growth for the subsequent years – in the case of high fodder yields and favourable economic conditions up to, or even above the pre-war level! This was indicated otherwise by a sudden increase in the stock of young animals in 1937–1938. The number of young animals increased by almost 100 thousand in a year which meant more than 78 per cent of the growth of the total stock. All this provided a sound basis for a further increase, still, if only examining the period between 1920 and 1938, we find no substantial change in the age and sex composition of the stock during this time. All that happened during those twenty years was, in essentials, the direct consequence of the economic situation or the trend of fodder yields, but beyond this no considerable structural changes occurred. Surveying the data, however, it should be pointed out that in the second

half of the thirties, particularly after 1937, the structural conditions of a rapid development were given. So, when in the first years of the Second World War the market showed favourable tendencies, and due to the territorial changes new regions joined in the economic life of Hungary, such as Bácska* and certain parts of Upper Northern Hungary,** which had abundant fodder surpluses, what had only been a possibility came true: the cattle stock reached a peak in 1942. This sudden increase is reflected in the final results of the 1942 registration of animals(2).

It must be emphasized, however, that on the present area of Hungary, without the fodder surpluses of the regions annexed then to Hungary and the boom caused by the war, this increase of the cattle stock would not have occurred.

An essential component of the development of cattle breeding is the *trend of breeds* in the stock. Let us have a closer look at this question on the basis of the data of Table 31. It is, in fact, the results of changes in the frontiers of Hungary that are reflected in the picture outlined earlier on the trend of breeds. Accordingly, 61·8 per cent of that proportion of the 1911 livestock which fell on the post-war territory of the country was red-spotted cattle (while only 58 per cent when the total pre-war area of Hungary is considered), that is, within the new frontiers the composition of the stock was more favourable. The data in Table 31 on this problem indicate a considerable progress in this field between 1919 and 1938. True, the relevant data only begin with 1924, but according to them, the proportion of red-spotted cattle was even in the first year over 73 per cent. Thus, from 1911 to 1924 the proportion of this breed grew from 61·8 to 73·1 per cent. This progress in itself seems perhaps too great, since the annual growth was about 0·869 per cent, which later was only attained under exceptional conditions (such as in 1927 and 1932) and followed even then by a rapid decline immediately afterwards. Yet, this progress is not unrealistic if we think of the boom during the war, and of the system of requisitioning which also tended to improve the quality of the cattle stock, as—quite obviously—less valuable animals (from the aspect of the breed as well) were slaughtered in the first place. The same result was probably attained by the extensive slaughtering of cattle in 1921, since it certainly was the animals of lower quality that were slaughtered first, then, too. So the 73·1 per cent proportion of red-spotted cattle in 1924 is not surprising. Although the subsequent—relatively even—progress which led to a 78·5 per cent proportion of the red-spotted cattle by 1938, the end of the period, was not quite smooth, and—what is even more important—the 0·385 per cent annual average growth remained far behind the growth rate of the period between 1911 and 1924, the years during and immediately after the First World War; we can still witness here a significant development which unambiguously improved the quality of the stock and increased its profitability.

The proportion of red-spotted cattle was considerably influenced by the eco-

* The present Voivodina, a part of Yugoslavia.
** The present Slovakia.

nomic crisis. Between 1931 and 1933, it grew not so much by an increase in its absolute numbers, but rather as a result of the number of cattle of other breeds falling back rapidly. Thus, in that period any reduction in the number of cattle took place at the expense of the grey Hungarian breed. In 1934, on the other hand, when the proportion of all the other breeds decreased, the red-spotted cattle increased also in number (!), and this suggests that a structural transformation began when the crisis was at its worst. The crisis resulted in a tendency to reduce the prime cost and improve the output by increasing the number of red-spotted cattle rather than simply sell out or slaughter the stock and thus try and raise the value of the animals left. From this point of view 1934 is a turning point in cattle breeding. We can see here a new conception of breeding instigated by the crisis, which first evolved slowly but in 1937–38 already at an increasing rate. This phenomenon is all the more important as it shows that cattle breeding did not tend toward extensive methods as a response to the crisis, as it so often happened in crop growing. On the contrary, the crisis promoted the raising of a more intensive breed. Of course, the development of a breed is a very long process which has its preliminaries in the past decades, so the crisis helped in giving an impetus to transformation rather than actually transforming the cattle stock.

All other breeds within the cattle stock were decreasing at a more or less rapid rate. The reduction of the number of grey Hungarian cattle as well as its drop of proportion from 17·5 to 11·5 per cent was particularly remarkable. The stock of badger-coloured cattle decreased at a similar rate (from 1·7 to 1·0 per cent) and this could not be prevented, only slowed down (the slight increase around 1935 can be explained by this) by the effort of breeders to protect this breed. The number of buffalos (a "relative" of the cattle) became lower too – though somewhat more slowly, as the process was hindered by occasional increase in the stock. The crisis was not thus favourable for extensive breeds, though – as regards Hungarian agriculture as a whole – it promoted the revival of extensive breeding tendencies. This statement cannot be affected by an increase in the stock enumerated as "other breeds" in Table 31, since this column includes various "spotted" breeds as well as mixed breeds which were somewhat more intensive than the grey Hungarian breed. In a sense the increase in the number of cattle breeds included in this column is a sign of improvement in quality, as the hybrids developed through a secret improvement of inferior breeds were ranked among them as well. A qualitative change in the stock was thus beyond doubt, and even if it did not grow in number, its quality improved considerably in the inter-war period.

Let us now have a look at the regional distribution of the cattle stock and see whether there was an essential change in this field during the two decades and whether the traditional breeding districts showed any further development or if new ones were brought about. All these questions can only be answered if the relevant data are followed from time to time, as seen in Table 32. Only the data of some important years representing a turning-point will be compared and those years which meant the beginning or strengthening of a new trend of development in cattle breeding.

Table 32. Distribution of the cattle stock (1000 animals) according to regions in Hungary(3) 1924–1938

Regions	1924	1925	1928	1931	1934	1938
Transdanubia	945	951	900	930	838	990
Great Hungarian Plain	697	704	662	629	604	638
Northern Hungary	250	259	249	253	228	253
Hungary total	1892	1914	1811	1812	1670	1881

If the data of the first and the last years are compared, the total number of the cattle stock comes to about 0·6 per cent less than in 1924. However, within this we can observe essential differences. If we examine the figures referring to certain large regions of the country we find an increase in the stock mainly in Transdanubia and to a lesser extent in the northern areas. During this period the cattle stock increased by 4·76 per cent in Transdanubia and by 1·20 per cent in the northern part of the country, while in the Great Hungarian Plain it decreased to a much higher extent – by 8·49 per cent. That this relatively great decrease did not happen by chance, but was the consequence of an ever more dominant tendency, is shown by the fact that after 1925 the cattle stock in the Great Plain was 4–6 per cent less in each successive phase.

This harmful tendency, which further decreased the relatively small cattle stock in the Great Plain, and which aggravated the problems of development of the whole agriculture in this area, seemed to be extremely difficult to stop. This process was only a concomitant of a more extensive way of production prevailing in the Great Hungarian Plain. It could not even be stopped by the relatively large market in the capital, since the cattle stock in Pest County decreased by 8·24 per cent, that is, its rate of decrease was only 0·25 per cent behind that of the entire area of the Great Hungarian Plain. The situation was even worse in Jász-Nagykun-Szolnok County, where the cattle stock decreased by more than 15·1 per cent, while the most decrease – by 15·25 per cent – occurred in Szatmár County where the situation was the most unfavourable for cattle farming. The cattle stock of Szabolcs County was also considerably reduced (by 9·70 per cent). In these counties, besides the poor natural conditions, the loss of earlier markets – as a consequence of changes in the frontiers – also contributed to a reduction of the stock, since e.g. with the relatively low price of milk, transportation to the capital was not profitable. Reduction of the number of cattle in this area thus seemed logical, but the great decrease in the cattle stock of the Danube–Tisza Interfluve was all the more surprising – and is at the same time characteristic of the nature of the whole process.

The other side of the development was represented by Transdanubia, where the cattle stock grew by 4·76 per cent. This did not mean, of course, that this tendency was uniform all over Transdanubia, just as the cattle stock of the Great Plain was not reduced everywhere either (in Hajdú County for example it slightly increased), but growth was undoubtedly a characteristic feature of development here. It is interesting that in Somogy County, one of the most typical districts

of the region, the stock showed a slight decrease, while the more or less stagnating number of cattle in the counties of Sopron and Veszprém was the consequence of impaired market conditions. The effects of losing the markets of Vienna and Lower Austria cannot be left out of consideration. The cattle stock grew in all the other Transdanubian countries, especially south of Lake Balaton(4). The 11·34 per cent increase of the stock in Baranya County was outstanding, but the growth of the cattle stock in the counties of Tolna (7·86%), Vas (6·72%), Zala (5·59%) and Fejér (5·19%) also exceeded the average rate of growth found in Transdanubia. The gradual concentration of cattle breeding in the southern part of Transdanubia was not slowed down even by the progress made in the northern counties of Transdanubia, Komárom and Esztergom, where the growth exceeded 9 per cent. Owing to the low number of the cattle stock even this high rate of development did not produce important changes. It is rather surprising that while on a national scale, the distribution of the cattle stock underwent a remarkable change, in Transdanubia the balance was on the whole maintained. The proportion of the stock in the large livestock breeding counties of Transdanubia (Baranya, Fejér, Somogy, Tolna, Vas, Zala) hardly changed, if compared with the total livestock of Transdanubia. In 1924, 71·21 per cent of the total cattle stock of Transdanubia was concentrated in these counties, and this ratio did not become considerably higher (in spite of the great increase in the number of cattle in these counties); by 1938 it only rose to 71·99 per cent. Thus the development in Transdanubia was fairly even. It is worth mentioning that within the total cattle stock of the country there was a shift in favour of Southern Transdanubia. While in 1924, 35·57 per cent of the total stock was in this area, in 1938 – in spite of a slight decrease, or at least stagnation of the total cattle stock – this proportion was 37·83 per cent, which, with the conditions of the period taken into consideration, meant a significant change. In Transdanubia the development of the stock – as shown by our data – took place mainly in the second half of the thirties. Between 1934 and 1938 the development in this area generally showed greater fluctuations than in other parts of the country.

This raises another question: how soon did the changes come about of which only the final results were seen? How did the individual regions respond to the changes in the economic life? Some data indicate that while the total cattle stock of Hungary changed according to the periods described earlier, the different regions did not give the same response within an economic cycle. The consistently decreasing number of cattle in the Great Plain was a highly surprising phenomenon. Apart from 1925, when some growth occurred compared to 1924, the cattle stock of the Great Plain gradually decreased up to 1935–1938, which was another period of boom. Thus the structure of the whole agricultural production must have been responsible for the decrease (which probably had its roots in the pre-war conditions). This could only be compensated for by a better economic situation: when after the outbreak of the Second World War new territories were annexed to the country, the supplying area of Hungary widened and prices increased. By 1942 the stock of the Great Plain had again grown considerably and greatly exceeded

the 1924 level. The extraordinary situation is demonstrated by the fact that the livestock of the Great Plain showed the best rate of increase by 1942, and even in the sourthern parts of Transdanubia the growth of the livestock slowed down, while in the northern counties it kept abreast with the development of other regions; thus no further concentration of the cattle stock in Transdanubia can be observed during that period, and even the tendency of the previous period could not be felt so much as in the critical years.

The cattle stock in Transdanubia and the northern part of Hungary showed roughly the same trend of development as the total stock of the country: it increased between 1922 and 1924, decreased by 1928, increased again by 1931 and dropped to a minimum by 1934; then between 1934 and 1938 it started to grow again. This curve follows the overall trend of development, with the slight difference that if we plotted our data, the curve for the northern part of Hungary would be somewhat flatter. The tendencies of increase and decrease were less marked than in Transdanubia. This can probably be explained by the essential difference between the two regions of the country in the form of utilization.

Using the data(5) of the national registration of 1935 for this purpose, we can have a look at the forms of utilization at a time when the worst was already over, but the boom was not yet able to substantially modify the structure of the livestock. It is thus conspicuous that in Transdanubia the cow stock was much smaller at that time. According to the animal census of 1935, 50·10 per cent of the total stock of Hungary consisted of cows, in Transdanubia 47·28, in the Great Plain 54·7 and in the northern areas 51·90 per cent was the corresponding proportion. (The data differ from those of the spring registration of useful animals made in the same year, as the census took place at another time.) Meanwhile, the share of draught oxen was also much lower. This was 8·22 per cent on a national average, 9·24 in the Great Hungarian Plain, 10·45 in the North, while only 6·69 per cent in Transdanubia. All this suggests that in Transdanubia reproduction and raising of animals were the main objectives even when following the economic crisis, the cattle stock was greatly reduced in numbers. And – in a highly characteristic way – in 1942 the proportion of the cow stock dropped to 39·75 per cent in Transdanubia, while in the Great Plain and in the northern areas of the country it remained above the 42·71 per cent average of Hungary with 46·55 and 42·77 per cent, respectively(6). Even more remarkably, in all the major cattle rearing counties of southern Transdanubia the proportion of the cow stock was above the Transdanubian average, which suggests that in these areas the effect of the crisis was worse. All this does not mean, of course, that the absolute number of cows in Transdanubia was not higher than in either the Great Plain or the northern part of the country.

In 1935 almost half of the total stock (46·98 per cent) was in Transdanubia, and the important role of the Transdanubian cow stock is also shown by the fact – discussed later from different aspects – that in 1930, 79 per cent of the dairy plants of Hungary (1983 units) functioned in Transdanubia(7). The cow stock of Transdanubia exceeded by far those of other parts of Hungary, not to speak of

its total young cattle stock. The absolute number of cows in 1935 was 20 per cent higher in Transdanubia than in the Great Hungarian Plain and 25 per cent higher than in the hilly northern areas of the country. So the role of Transdanubia was highly important concerning the young stock.

Investigations on the distribution of draught oxen give somewhat surprising results. In 1935 draught oxen alone made up 6·69 per cent of the total stock in Transdanubia and this was lower than the national average (8·22 per cent), while the same proportion was considerably higher both in the Great Plain (9·24 per cent) and in the northern parts (10·45 per cent). Ploughing with horses, and mechanized soil cultivation and transportation were also more wide-spread in Transdanubia than in other parts of the country. In the northern regions the breeding of more draught oxen was justified by the specific conditions of the soil. This was not, in fact, surprising, but the great increase in the number of draught oxen in Transdanubia by 1942 was remarkable. As a result, 8·08 per cent of the total cattle stock were draught oxen while in the Great Plain this proportion – after decreasing slightly – became stabilized around 9·08 per cent (though in absolute numbers they increased here, too). This shift toward a more extensive way of production in Transdanubia(8) in the very years of boom is surprising, although in all probability – as data are not available – the number of draught oxen was only increased in the last three years due to commandeering of horses during the war. In the Great Plain, however, the stock of draught oxen did not become larger, since their use had even earlier been more wide-spread.

As we have mentioned, the number of the cattle stock remained at the same level during the whole period. So, greater attention must be paid to the improvement of its quality. This is almost the only way we can determine whether or not cattle breeding made any progress in the inter-war period.

One of the most spectacular manifestations of an improvement in quality was undoubtedly the increase in the red-spotted cattle within the total stock. The relevant data have already been presented, so here we only refer to the fact that this increase in the proportion of an intensive breed resulted in a more balanced state of the whole stock, since four-fifths of the total cattle stock belonged to the same breed. The increasing dominance of the red-spotted cattle had a highly favourable effect on the composition of the whole cattle stock as it served three aims: it developed relatively faster, it produced more milk and meat and was even suitable for draught work. The uniformity of the stock improved, and the red-spotted stock itself grew in value and conformed more to the character of the breed. This was mainly due to the fact that – especially from the second half of the twenties – better quality sires were introduced into commercial production. Besides the milk yield, the average live weight and meat yield also increased. Feeding improved, feed utilization became more up-to-date. However, it is very difficult to record this on statistical tables.

One of the indices of qualitative improvement in the cattle stock was the trend of *milk production*. This can be taken as a basis of qualitative development under Hungarian conditions where the amount of milk produced is examined with an

essentially unchanged stock of cows, that is, any increase or decrease in milk production may serve as a measure of development or decline. In this respect there was a considerable development. Although no statistics on a national scale are available concerning the amount of milk produced, certain data indicate a progress. One of the characteristic symptoms is a relatively rapid increase in milk production. In the early twenties 20–30 million litres of milk were delivered a year in Budapest, and by 1930 this amount had risen to 150 million litres. In the years of the crisis deliveries dropped to 114 million litres (in 1935), and rose again, settling around 140–146 million litres, which was at least seven times as much as the amount of milk delivered in 1919–20. As regards the latter, we naturally have to think of the unfavourable situation caused by the war in 1919–20. Still, the fact that even in 1926 the annual amount of milk transported to Budapest was only about 75 million litres shows the enormous progress made in this field by 1938. The annual amount of milk delivered to the dairy plants also grew at a relatively uniform rate even during the years of the crisis. It was 216 million litres in 1927 and by 1934 the output had reached 350 million litres. After a slight decrease during that year, it rose to 440 million litres by 1938.

It is naturally another question – discussed later in detail – that the increased amount of milk sold is not primarily the consequence of a similar increase in milk production per cow, but only shows the higher proportion of milk brought to market.

The volume of cheese production doubled too; in 1938 it was 396 waggons compared to 188 waggons in 1927. Development in this field was less uniform as the periods of upswing were regularly followed by two or three years of decline. *Butter production* grew even more rapidly: from 272 to 1129 waggons – i.e. fourfold – during the same period. It must be mentioned here that butter was marketed not only within the borders of the country; an increasing amount of the produced volume was exported. Both in the field of production and export a change occurred in 1930, when butter production increased by 40 and export by 200 per cent (!) as compared to 1929. In the thirties the larger part of butter production – in 1933 e.g. 68·6 per cent of high quality butter – was exported. This great increase in production, or more exactly in the amount of milk sold, was paralleled by the development of industry and trade which was remarkable considering the relatively rapid growth. In 1927 the number of dairy plants was 1567; this figure grew, however, rapidly, amounting to 1851 by 1928, while in 1931 already 2117 dairy plants were in operation. In 1932–1933 there was a slight drop, but afterwards the number of dairy plants reached 2248 by 1935, then in the second half of the thirties, after an especially rapid progress, this exceeded 2800 in 1938 (45·81 per cent of the plants was managed on a co-operative basis compared to 19·93 per cent in 1931 and only 14·99 per cent in 1927). The whole network of milk processing and marketing was modernized; its development was promoted by the government as well(9).

However, in spite of this increase in milk production and processing, the cow stock – as seen before – did not grow, since low milk prices did not make an

increase worthwhile. Instead there was a *growth in the amount of milk brought to the market* and the degree of exploitation of the stock, that is, the *milking average* had to be raised, even if this did not happen to the extent suggested by the above data. We have to give an account here of an apparent though relatively slow development, although only estimates are available for the period. According to these(10) the milking average was 1000–1500 litres in the twenties and about 1 800 litres in the thirties. Indeed, the 1930 survey – which, however, covered only the stock of cattle owners with lands – demonstrated a daily 6·1 litre milk output on a national average which corresponded to an annual amount of 1 830 litres (with ten months of lactation taken into account)(11). According to the survey, 74·5 per cent of the cows were milked. The daily 6·1 litre national average covers, naturally, considerable regional differences. So the average in Transdanubia was 6·3 litres, while in the Great Plain only 5·8.

Significant differences can be found between the various categories of farms too. On farms smaller than 12 ha the average output of cows was only 5·7 litres a day; between 12 and 60 ha it was 5·9 litres, from 60 to 600 ha 7·8 litres, and on farms above 600 ha 9·6 (!) litres. Of the milk they produced, 51 per cent was sold. In Transdanubia the amount of milk marketed was 60 per cent, in the Great Plain 46 per cent, while in the northern areas of the country only 36 per cent. Of milk produced on farms smaller than 60 ha – i.e. on those owned by peasants – only 46 per cent, of the milk production of farms between 60 and 600 ha 69 per cent, while on large farms above 600 ha 78 per cent of the produced milk was sold. So it was not by mere chance that 79 per cent of the total number of dairy plants was in Transdanubia that year which was partly the consequence of better dairy marketing in Transdanubia, but at the same time promoted the development, i.e. an increasing rate of marketing, in that region (Table 33).

In spite of the data of the survey made in 1930 we cannot say that the milking average exceeded 1800 litres before 1938. According to the data of the Hungarian Institute of Farm Research(12) between 1924 and 1938 the average milking output grew from 1500 to 1750 litres which – though lower than the 1830 litres average of 1930 – meant a more than 16 per cent increase. With these data at hand the results of the 1930 survey cannot be regarded as ranging in the middle between the twenties and the thirties.

The milking results of the registered stock provide a much more favourable aspect than it was in reality. Control of milk production generally covered the

Table 33. Daily milk yield of cows according to farm categories (litres) (1930)

	Below 12 ha	12–60 ha	60–600 ha	Over 600 ha	Average of all farms
Transdanubia	5·7	6·3	8·7	9·9	6·3
Great Hungarian Plain	5·6	5·5	6·9	9·1	5·8
Northern Hungary	5·8	5·9	8·6	9·1	6·2
Hungary total	5·7	5·9	7·8	9·6	6·1

registered stock, and since – especially before the First World War – herd-books were only laid down in dairy farms working with the most up-to-date methods it is easy to imagine how distorted the picture would be if the national milking average were set on the basis of the average milk yield of registered cow farms. Knowing this, we must be very careful in using the relevant data(13), as in the first half of the twenties, in fact up to 1926, the registered stock itself was very small, and the survey was only extended to the stock of the so-called large dairy farms possessing more than ten cows each. We may say that the data only show the milking results of the elite stock, and it is all the more surprising that by 1926 this reached an annual average of 2689 litres. Earlier the output had been much lower. This truly reflects the drop in the last years of the war and during the revolutions. The 1740–1875 litres milking averages of the best dairy farms in 1920–21 suggest that the national average of milk production could not have been more than 1000–1200 litres a year!

Investigations on the milking results of the registered stock may still reveal interesting correlations, it is therefore worth-while to have a close look at the relevant data. Until 1926 herd-books were only established for the cow stocks of larger farms; in 1926, 4945 cows of sixty-nine dairy farms were under control. A greater development in this field began in 1926 when the number of cows checked throughout the year doubled within a year, and this progress continued at a relatively fast rate. The number of cows kept under regular control was 49 651 in 1938. The number of cows checked throughout the year was somewhat lower than that – about 30 000 –, but even so, the development was considerable. The amount of milk produced per cow in the controlled stock even rose to 3500 litres in 1932–1933, though this level could not be maintained and the yield soon fell to 3100–3200. Naturally, the fat content of milk decreased from 3·9 to 3·7 per cent(14) parallel with the increase in milking average being the usual concomitant of the higher milk yield. However, when comparing the results of larger dairy farms with those of smaller ones a more interesting feature is revealed.

In dairy farms with more than ten cows the milking average naturally exceeded – though not much, only by 100–200 litres – the averages presented above. The output in small dairy farms with less than ten cows, on the other hand, was 700–800 litres below the average almost every year when examinations were carried out. The difference between the output of small and large dairy farms ranged consequently from 800 to 1000 litres, which is, in fact, a very great difference if we consider that the survey was made of the best cows, i.e. in the best dairy farms, with respect to both the small and large farms. In addition, the cow stock of farms with more than ten cows was much larger than that of smaller farms, that is, the former was much more balanced than the latter, where, very probably, only the cows with really outstanding results were checked.

Thus, if all this is considered, the *gap* between the milk yield of large farms and small peasant farms seems even larger. The enormous inequality can hardly be explained by the difference in breeding, although the latter may have played a role in it too; the divergent methods of breeding and feeding were responsible for it.

Large farms responded to the relative drop in milk and meat prices by reducing the number of cows, that is, by sorting out the animals of inferior quality and feeding the rest better in order to obtain a higher output. The small peasant farms had neither the necessary knowledge nor the appropriate feed for using up-to-date methods of feeding. They did not reduce the number of cows as the conditions of the farm did not allow it. On the contrary, they endeavoured to increase the stock in order to keep their excess labour force employed. It seems all the more surprising that the yield of small producers often surpassed those of large estates even under such conditions, though – naturally – these were exceptional cases. This occurred mainly in the Great Plain where cattle breeding generally remained behind the national level, and where feed conditions were even worse. The results of peasant stocks in the Great Plain – though naturally lagging behind the national average – generally exceeded the achievement of larger estates, although the fact that they usually were produced by a lower number of cows than in other parts of the country must be taken into account too. So it is not surprising that the results of the registered stock are quite good here, in contrast with overall milking results(15). Of course, it was this registered stock that yielded those few cows which attained outstanding milking averages on a world scale too. We know about some dairy farms – mostly owned by large estates, of course – which attained an annual milking yield of 5–6000 litres or so, and in the registered stock the number of cows producing more than 6000 litres of milk a year was about 2000. These cows were often owned by peasant farms, since the tremendous surplus labour involved in breeding such cows was not profitable in larger estates and with the latter it was mainly a matter of prestige. The annual output of a hundred cows exceeded 8000 litres and there were some that produced more than 10 000 litres a year. A cow named "Dáma 171" produced 19 644 litres of milk in 358 days (!) (with a fat content of 3·41 per cent), and one named "Basa 160" yielded 16 704 litres in 365 days (!) (butterfat: 3·16 per cent). The world record of butterfat production was held by "Auguszta"(16). When seeing such results we tend to forget the very low average.

Beyond what has been discussed so far, several other factors must also be taken into consideration. Thus, beyond the given feeding possibilities and price conditions, a number of intellectual factors also play a role in cattle breeding and this must be neither neglected nor underestimated. The knowledge and skill of the staff of a farm (from this point of view it is all the same whether they are small peasants or farm servants working on peasant farms or large-scale farms) are in themselves a capital by which one can make a profit in cattle breeding much sooner than, say, in the branches of crop growing. The introduction of new types (especially that of the so-called "economic type" which played an important role in that period and has a barrel-shaped trunk, relatively short legs, good conformation, solid organism and a medium sized body) was not a mere breeding problem or a question of changing sires but it also required a wider knowledge of livestock breeding. It is worth-while paying attention to these questions, too.

Herd-book registration is the first to be examined closely, as it is an indicator

of the development of livestock breeding. In this field, undoubtedly, very great progress was made, mainly until 1938. The fact that by that time herd-book registration was organized on a national scale, and also the size of the registered stock grew considerably, was the result of a progress made in the two decades concerned(17). Before the First World War no herd-book registration on a national scale could be spoken of as at that time only the best and most up-to-date dairy farms were registered. By 1938, however, 50 000 cows were already registered which seems to be an excellent result. Not unexpectedly only 22·5 per cent belonged to smaller dairy farms, which was a mere 1·5 per cent of the total cow stock owned by peasants. An essential change in this field occurred only after 1938 when all expenses involved in the work of registration were taken over by the government(18). In 1943 e.g. already 146 000 cows were registered in herd-books in Hungary, of which 95 000 were owned by peasants, that is, there was a considerable shift in the earlier proportions as a consequence of the favourable policy of the previous years. Yet it cannot be regarded as a measure of development; the above cited data of 1938 concerning development in the twenties and thirties are much more characteristic than that. Development was confined almost exclusively to the stock of large estates.

The slight improvement in the raising of *breeding animals* evokes rather mixed feelings in us. Breeding animals were raised on a much broader basis than the registered stock, since such restrictions would have prevented good results. No data other than the breeding material presented at agricultural exhibitions and cattle-shows in Budapest are available here, but they undoubtedly show a certain development. However, a statistical appraisal is extremely difficult, almost impossible in this case. Still, an undeniable improvement can be spoken of especially in the quality of breeder bulls which was also promoted by the government through the Swiss breeder bull purchases of the Ministry of Agriculture(19). The supply of sires, however, did not much improve at that time, as will be seen later, so the development of the breeding stock was fairly limited.

However, before discussing this problem in detail it seems necessary to mention other questions concerning the qualitative improvement of the stock. Our attention has been concentrated so far—quite rightly—on the red-spotted stock which at that time already made up the bulk of the stock. But the grey Hungarian and badger-coloured stocks cannot completely be left out of consideration either. As regards both breeds it is enough to refer to the fact that efforts were made to improve their quality. Special emphasis was laid on breeding grey Hungarian cattle by crossing them with bulls imported from Italy (Maremann breed)(20). Efforts were also made to improve the interior properties too, and enthusiastic protectors of this breed even tried, though without much result, to raise the milking average. The attempt to develop the grey Hungarian cattle into a three-purpose breed and at the same time maintain its favourable characteristics, ended in failure. All this preceded—and involved—the extension of registration to include this breed, which enabled an assessment of peasant stocks. The additional expenses of management and care connected with the best stock grouped in herds of fifty

were taken over by the Ministry of Agriculture, and the above mentioned work aimed at improving the yield was carried out by the use of these herds(21).

Every effort to improve the badger-coloured stock yielded local results at the best. As seen before, only a fraction of the original stock remained within the new borders of Hungary, and complete stocks of this breed were only found in the dairy farms of a few larger estates. These estates endeavoured – partly with the help of the movement organized for the protection of the badger-coloured breed – to improve the quality of the stock. They even made experiments with imported Austrian and Swiss bulls. However, the result did not make it worthwhile, though there was a slight improvement(22).

Attempts to improve quality had another consequence: the meat yield, and to some extent the draught capacity of the whole cattle stock became higher. Every effort to improve the exterior is, in fact, closely connected with an increase in meat production too, so it is obvious that these attempts had to result in a higher live weight of the stock. The amount of produced meat increased, that is, the slaughtered stock became more valuable. This is proved by the fact that between 1924 and 1936 the live weight of slaughtered animals increased considerably. The average weight of oxen grew from 516 to 596 kg, that of cows from 392 to 467 kg, while the weight of calves remained unchanged (63–64 kg). It is remarkable that the calf was the only animal which with respect to fattening was adversely affected by the crisis, for the simple reason that milk was sold at a higher profit. It was in that period that the practice of fattening spread all over the country including peasant farms, while earlier it was mostly carried on by the sugar factories and distilleries and by farms utilizing the by-products. The influence of the market on the improvement of quality is well illustrated by the Italian market whose demands resulted in the replacement of heavy fat cattle by younger, lighter animals and this, naturally, changed the method of fattening too: it was gradually adapted to the demands of the market on these farms(23). Higher meat production increased the draught capacity to some extent, too; owing to the larger body and better state of development the red-spotted cattle stock became in general more suitable for draught work. It was during this period that the theory that red-spotted cattle were unsuitable for draught work was ruled out for good. Some of the cow stock were even used in draught work regularly and their proportion did not decrease until 1938(24).

When studying the development of livestock breeding we have to pay special attention to the state of supply in sire. This aspect became the centre of interest especially after the war when the breeding discipline established in earlier decades was upset, and since no sufficient sires were available, illegal mating became a frequent practice(25). One of the most important manifestations of livestock breeding policy after 1920 was therefore the improvement of the bull supply, that is, an attempt was made to settle this serious problem satisfactorily.

The government policy for livestock breeding yielded good results in this field. First of all, the farm inspectorates established at the end of the 19th century were reorganized, the numbers of their staff increased, district farm inspectorates were

established – which were indispensable preconditions for a satisfactory settlement of the question(26). (The main task of the inspectorates was to check on the condition of agriculture – and mainly of livestock breeding.) The government supplied the breeding organizations and associations with experts and the official veterinarians were also included. Training courses were organized for dairy farm inspectors who were later given state employment in the period of consolidation(27). The preparatory work of several years was crowned by the law decree of 1927 on the testing of sires. The government assisted the villages in purchasing breeder bulls by granting 10–20 per cent of the price in state subsidies and by placing the purchase price at the villages' disposal in the form of a loan(28). Another form of assistance was an eighty per cent preferential tariff when transporting breeder bulls by trains(29). In the middle of the twenties the imports of high quality foreign bulls increased, too. The fact that sire raising was greatly extended on state owned-stud farms, was also an important step forward. Furthermore, the villages were given considerable state subsidies to build stables for the sires.

Attempts were made to improve the way sires were used. The Ministry of Agriculture tried to introduce the method of mating from hand as far as possible, which – if carried through in the whole country – would have considerably improved both the state of sire supply and the quality of the stock. Let us see what the results of all these efforts were.

Exact data are available only from 1924 on, but the quality of the sire stock was obviously worse before and its number must have been much below the 1924 level. Still, when considering the entire stock of sires we must speak of some decline. It is beyond question that in spite of all government measures, subsidies and preferences, the total number of breeder bulls was – with some fluctuations – reduced. Some increase in the number of breeder bulls was only shown between 1925 and 1932, but even then growth was not graduated but fluctuated to a great extent; and after 1933 a gradual decrease followed. All in all, a slow decrease of the stock is revealed by the investigations, corresponding by and large to the numerical stagnation of the whole cattle stock.

Within the breeding stock, however, the proportions changed considerably. In accordance with the government policy the stock of breeder bulls used in commercial production substantially grew in proportion (from 55·6 to 63·2 per cent), even if in numbers only from 9700 to 10 700. The number and proportion of breeder bulls used in private breeding decreased accordingly to a considerable extent. All this was important mainly because it meant a better bull supply for the cow stock owned by small peasants, since the larger peasant farms and estates usually had their own breeder bulls(30).

Considering the whole period, we find that the sire supply became worse. According to the contemporary literature on livestock breeding in the case of voluntary mating fifty, with group mating sixty, and when mating from hand 70 cows fell optimally to each bull. The Hungarian average was much higher than that. If we take the scientific results as the basis, roughly fifty or sixty cows

ought to have fallen to one bull, since the method of mating from hand had hardly spread yet, and the stock – especially in certain regions – reproduced itself by the least controlled "method" of voluntary mating. The number of bulls of relatively low value was rather high, since some of them were underfed and overused, especially those owned by the village. Throughout the country, but especially in certain regions, heifers younger than two were covered as well and this increased the exploitation of breeder bulls. Considering all this we can clearly see that even fifty or sixty cows would have been too many for a bull. The actual situation was even worse than that. The national average regularly ranged between seventy-nine and eighty-five cows, which showed a considerable extent of overuse. We must not forget either that the number of breeder bulls decreased at the very time – the second half of the thirties – when the stock of heifers older than two years increased, which again was found to lead to overuse.

These data conceal tremendous differences both in regional and in farm relations. Analysing this for the whole period is quite impossible, but we can still point out at least the major discrepancies. But to do this, we first have to see the data concerning the cow stock of farms with or without breeder bulls of their own.

During the whole period the cow stock was owned mostly by farmers who had no breeder bull of their own. The proportion of cows belonging to such farmers constantly increased within the total cow stock. While in 1924 this proportion was 83·6 per cent (more than four-fifths of the total stock even then), by 1938 it exceeded 86 per cent. However, it was not only a simple change in proportions, because the cow stock of farms with breeder bulls of their own decreased in numbers too: from 146 000 in 1924 to 127 000 by 1938(31). The importance of bulls used in common breeding was, therefore, considerable. Knowing these data we find the 10 per cent decrease in the number of bulls used in common breeding even more substantial, since a cow stock of about the same size had to be covered with the reduced number of bulls.

First of all, the national ratio of bulls is interesting. In 1938, 81–82 cows fell to one breeder bull on a national scale. This is undoubtedly a fictive number. The actual situation is certainly seen much better if the number of cows per bull used in common and in private breeding, respectively, is considered separately. Accordingly, the number of cows per bull used in common breeding was eighty-five, while only twenty-seven cows fell to one bull in private breeding. The tremendous difference is obvious and if we consider the earlier situation, there is no doubt that in the cattle branch – except the large-scale farms – the supply of sires was at an extremely low level.

Table 34 depicts this situation according to regions and breeds.

It is apparent even at first sight that the conditions of common breeding were the most favourable in the northern part of Hungary, while in the Great Plain the number of cows per bull was the highest, and the situation was worsened by the fact that mating from hand could hardly become a general practice on the relatively large lowland pastures. The case was different with bulls used in private breeding. The Great Plain was in the most favourable position together with the

Table 34. Number of cows per bull in the different regions of Hungary in 1938(32)

Regions	Total stock		Grey Hungarian		Simmenthal		Badger-coloured		Other	
	common	private	common	private	common	private	common	private	common	private
Transdanubia	84	31	75	38	83	31	114	34	618	38
Great Hungarian Plain	90	24	47	25	87	20	278	32	360	46
Northern Hungary	76	24	60	19	68	24	84	10	668	38
Hungary total	85	27	52	26	82	26	169	28	424	43

northern counties, while Transdanubia was far behind the Great Plain. Here not only the grey Hungarian cattle is considered which had favourable conditions of common breeding in the Great Plain where only forty-seven cows fell to one bull (compared to sixty in the North and seventy-five in Transdanubia), which is a fairly good ratio even in the case of voluntary breeding! In private breeding the general state of bull supply was rather good in the Great Plain. In the private stocks the supply of Simmenthal bulls was the best in the Great Plain (twenty cows per bull), as to the other breeds it was about average. What is conspicuous is not so much the relatively high ratio of bulls almost in all breeds in the northern areas of Hungary (grey Hungarian 1 : 19, Simmenthal 1 : 24; badger-coloured 1 : 10!; other 1 : 38) but rather the fact that Transdanubia remained far behind the other two regions and below the national average in this field. The fact that in the private stock the number of cows per bull was thirty-eight in the grey Hungarian breed and the same in other breeds, does not in itself reflect a decline; it only shows that private breeders did not lay greater emphasis on these breeds and that, besides, they often used spotted bulls for grey Hungarian cows. The actual situation is much better shown by the fact that the ratio of the Simmenthal breed in the private stocks was again the worst in Transdanubia and even in the common stock it was hardly above the national average. This picture reflects the peculiar position of the whole cattle branch. The leading region of cattle breeding in Hungary was Transdanubia, where the red-spotted stock had been established earlier. The phase difference between Transdanubia and the other parts of the country was shown in the state of bull supply, which had a much more important role in the Great Plain and that is why the number of bulls was higher there. (Naturally, the settlement system of the Great Plain was affected it too, the conditions of detached farmsteads demanded self-sufficiency in every respect!)

Even the national data are not uniform for all breeds. When they show that eighty-two cows fell to one Simmenthal bull in common breeding, they reflect, in fact, the breeding tendency. With the grey Hungarian breed the situation was much better (fifty-two cows), but the national average was still about eighty-five and this was not changed by the fact that with the badger-coloured breed the ratio of bulls to cows was 1 : 169 (!) and 1 : 424 in the other breeds (!). This fact shows the neglect of the latter breeds rather than the promotion of the Simmenthal cattle. In the private stocks this tendency is not clear on a national scale either, since the

ratio of bulls to cows is 1 : 28 in the badger-coloured breed and 1 : 43 in other breeds. Thus, in a certain sense, these breeds were preserved and maintained by the private stocks, because in common breeding both the badger-coloured and the "other" cows, as well as all cows of foreign breed (e.g. Dutch lowland, Pinzgau, black-spotted, even when pure-bred) were usually covered with spotted bulls – in accordance with the breeding policy of the government –, and this undoubtedly improved the quality of the total stock.

In Transdanubia the badger-coloured and the so called "other" breeds of mixed crossing were gradually excluded from common breeding. Of the badger-coloured breed eight bulls were used in common breeding only in a single county, while of other breeds in three counties only one bull for each, and in one country two bulls, and in the entire area of Transdanubia a total of eighteen bulls were to be found, each of which *would have had* to cover 618 (!) cows – if the latter had not obviously been mated with spotted bulls. These disproportions were responsible for the relatively low ratio of bulls to cows in Transdanubia. The grey Hungarian breed showed a similar tendency of dropping out of common breeding. Apart from the relatively favourable bull supply in Baranya and Somogy Counties, there was a total of some sixteen bulls in three other counties (Tolna, Vas, Zala); in the other areas the cow stock was either completely eliminated or declined to a few animals probably used for draught work (e.g. in Veszprém County). In the northern areas the situation was much more balanced; as for the Simmenthal breed, the situation was better here than in the other two regions, while the more favourable ratio of the badger-coloured stock (eighty-four cows per bull) was due to the low number of cows rather than to the higher number of bulls (there were altogether ten bulls in three counties). The fact that the number of bulls in the grey Hungarian stock was better balanced in these counties than in Transdanubia – which was felt, naturally, in the more favourable ratio of bulls to cows (1 : 60) – is much more important and shows that these areas, too, played a significant role in maintaining the grey Hungarian breed. The reduction of the crossed Hungarian stock summed up under the name "other" was much worse in this area than the statistical average, as is well reflected by the much poorer bull supply compared to Transdanubia (668 cows per bull!).

In certain areas of the Great Plain the grey Hungarian breed began to drop out of breeding. So in the counties of Bács, Bodrog, Csanád, Csongrád and around Szeged there were grey Hungarian bulls in common breeding, while in other counties of the Great Plain their ratio was quite satisfactory. The badger-coloured stock was slowly breaking up; two counties had twelve bulls altogether, while several dozens of cows were to be found in almost all counties (in Békés and Szatmár there were as many as 780–870). In the case of the Hungarian crossed stock summed up as "other", the situation was the same, with the difference that the distribution of bulls used in common breeding was better, even if their number was not sufficient for the relatively high number of cows. So several bulls were to be found almost everywhere (their number ranged from one to fifty-two), but the number of cows per bull was over three hundred in nearly every part of the Great

Hungarian Plain (in Hajdú County 3233!). So, here too, we can safely speak of a gradual elimination of the stock by crossing the cows with bulls of other breeds (occasionally with grey Hungarian bulls).

We have to mention, however, a conspicuous phenomenon: if we disregard the question of breed and consider the stock as a whole we find an apparent shortage of bulls in common breeding in some larger country towns. We have to speak of this phenomenon all the more because such a great difference between the conditions of towns and counties cannot be found either in Transdanubia or in the northern areas. For example the number of cows per bull used in common breeding was 106 in Baja, 129 in Hódmezővásárhely, 147 in Szeged, 127 in Kecskemét (the 1 : 589 ratio of Budapest is not important from this point of view). On close inspection these data reveal that this unfavourable position of larger towns was due mainly to the fact that no bull was kept in common breeding for cows of Hungarian breeds (with the exception of Kecskemét), while for the increasing number of Simmenthal cows the number of bulls used in common breeding was insufficient (the ratio of bulls to cows in this breed was 1 : 90 in Baja, 1 : 115 in Hódmezővásárhely, 1 : 147 in Szeged and 1 : 136 in Kecskemét). But even the situation of the counties was far from bright, with the single exception of Hajdú County; the number of cows per bull was generally over eighty, and in the counties of Bács, Bodrog and Szabolcs exceeded ninety.

As to the Simmenthal breed the ratio of bulls was relatively good if we disregard the conditions outlined above. Hajdú County and the town of Debrecen, where the ratio of bulls to cows was 1 : 132 and 1 : 649, respectively, are also an exception. In the other areas the density of Simmenthal bulls used in common breeding corresponded to the national average which – with the general backwardness of the Great Plain taken into consideration – seems to be a very good result. It was conspicuous that in the Great Plain – as if to compensate for the conditions of common breeding – the number of cows per bull was very favourable in the private stocks and in some counties it even ranged between ten and fifteen. If we leave the private stocks of Szeged and Kecskemét out of consideration, which had extremely bad ratios, the number of bulls in the private stocks of the Great Plain exceeded by far the national average. This was mainly the consequence of the system of detached farmsteads. It was no use keeping many bulls in common breeding here, since the great distance between the farmsteads, which was sometimes ten or twenty miles, and the distance between the farmhouses and the bull-grounds of the village made a profitable utilization of these farms impossible. In these districts the bulls of certain farms (larger estates and high productivity peasant farms) replaced the bulls missing from the organization of common breeding. This proved to be a very good business as shown by the density of bulls. The price of mating (in spite of the larger number of bulls) was much higher here than in other parts of the country, because the owners of cows (mostly small peasants with one or two bulls) were at the mercy of farmers who had bulls. This situation was not, naturally, unanimously favourable since it made it possible to maintain poorer quality bulls, while the settlement system and the resulting difficulty of control

encouraged the breeding of unregistered bulls. Advantages and disadvantages are thus reflected by these data.

The bull supply did not become any better in spite of the steps taken by the government and the 1938 conditions – apart from the private stocks – were far behind the demands of the era. All this is confirmed by what has been said about the defencelessness of the small farms. It is obvious that the insufficient number of bulls supplied for common breeding purposes made the small farms dependent on private stocks. Namely, there were but very few small farms in Hungary that had breeder bulls; the breeder bulls of small peasant farms were bought up by large farms, so small farms were entirely dependent on large estates when mating their cows. The situation was made even more difficult by the fact that the number of cows increased in small farms while large farms restricted the growth.

Another manifestation of the breeding policy of the government was the *protection of animals against diseases* – especially against epidemics. It was particularly in the control of cattle plague *(pestis bovina)* and infectious foot-and-mouth disease that the Hungarian veterinary science and animal hygiene attained outstanding results. In the period concerned, the major epizootic diseases were reduced to a minimum. Infectious foot-and-mouth disease only occurred toward the end of the thirties but was under control in a relatively short time. By pertinacious efforts, through protective inoculations, etc. the number of animals fallen ill with epizootic diseases was reduced from 4–5000 to 1300 a year(33). This also shows that these efforts were concentrated mainly on the protection of the cattle stock. It is not true thus that animal diseases prevented the increase of the cattle stock. The number of epizootic diseases – even of foot-and-mouth disease – was not more than a few thousand. So the biological possibility of increasing the stock was given. This is suggested also by the fact that in the period concerned, about fifty per cent of the calves born were regularly slaughtered. This fact in itself shows that it was not profitable to increase – or even maintain – the size of the cattle stock either for export purposes or for domestic use. It was through this biological possibility that the number of cattle could be increased in a relatively short time during the war.

The breeding policy of the state was in a sense completed by a *marketing policy*, which gradually actuated the whole field of cattle marketing. Namely, owing to the low world market prices first the export, then in the years of the economic world crisis the internal marketing, too, had been in danger. However, the marketing policy of the government, quite naturally, was not free of certain interests. Not only the interests of production and marketing were kept in view but it was also very important who produced the commodities to be sold. For this very reason these questions should be examined more closely.

To solve the problems of marketing at the beginning, in the period of boom following the war, it seemed sufficient to draw up contracts to ensure the export(34). The state intervened only when after 1929 under pressure of the economic world crisis both the maintenance of prices and the increase of exports were of vital importance. The monopolization of export began rather early; the most important

markets (Austria, Germany, Italy) already showed such tendencies in 1930. In 1931 a state association of animal exports was established with the aim of protecting the prices(35).

Export ensured a relatively high price and domestic prices fell far below the export prices. So it is easy to understand that an enormous competition for foreign markets developed. It is not worth going into detail here, but the main point is that every organization interested in the export profit tried to have the largest possible share in it. The peasantry of medium and lower strata was, in fact, the only factor that had hardly any role in the competition. Owners of large estates, livestock dealers and co-operatives – all had a part in it, as large sums were at stake(36).

The whole tendency of monopolization was undoubtedly disadvantageous to the peasantry. The import quotas determined by the largest importers (Austria and Italy) were distributed among the farmers, the merchants and the "Hangya" Marketing Co-operative(37). Later (in April 1936) the merchants' quota was eliminated, and the ratio became 75 : 25 per cent in favour of the farmers' stocks(38). It would seem as if the peasantry came off well if the "farmers' quota" had not actually involved primarily the livestock of large estates. We do not state that this was the way it had been planned from the beginning, but the pressure of economic life pushed the large-scale farms forward. The relatively high live weight (determined at ca. 650 kg) would usually have exluded the beef-cattle of peasant farms smaller than sixty ha from export even if the producers able to transport at least one waggon (minimum ten) cattle had not been given priority anyway through the farmers' quota. In this, naturally, economic interests were the dominating factors which resulted in the encouragement of fattening on large estates. But due to the fact that through the liquidation of trade (which was preceded by an intensive propaganda) the "agrarian" or "farmers' " interests came into prominence, was not all-important.

With the clearing of the export of trade the possibilities of export for the small peasant were, in fact, eliminated. The actual situation was the following: by liquidating the share of the trade, the government wished to ensure a larger proportion of the export profit to the large estates and to the "de-semitized" Hangya Co-operative supported by the state too, and served – according to the propaganda – the protection of the peasantry, but in fact the interests of the landowner aristocracy. The final consequence of promoting the agrarian "farmer" interests was best seen in cattle breeding itself: the result was the liquidation of peasant export possibilities and the skimming of the export profit by the large estates. With preference given to the co-operatives, the "Hangya" had the same results, as the cattle transported abroad by them was not from the peasants, but was produced by large estates. We do not want to defend the trade which kept its own financial interests in view and purchased animals first of all from farms which offered higher quality and better animals. Nevertheless, if it could get animals at a lower price, it absorbed a part of the peasant production too, and so, was more favourable for the peasantry(39). This process culminated in 1938, when the National Live-

stock Marketing Committee, which organized the selling, was established. By 1938 an overwhelming part of the export was monopolized, undoubtedly to the advantage of large estates. According to calculations in 1939 e.g. 74·4 per cent of the exports to Germany was made up by animals from farms above 100 cad. yoke. In exports to Italy the peasantry had a slightly larger share(40).

Another field affected by the marketing policy of the government was the marketing of milk. This is, of course, an enormous complex of problems which covers all questions of industrial, producer's and consumer's milk. The measures taken were called forth by the great fall in prices after 1929 and the parallel decrease of consumption. In the twenties the price of milk was relatively high, particularly in the first years following the war, when production was low. The effect of the crisis was felt in milk prices too. With the 1929 level taken for a hundred, the wholesale trade index of milk and dairy products was forty-seven in 1934. Producer's price of milk dropped from 24 fillér in 1929 to an average of 15 fillér by 1933 for the consumer's milk, and from 18 to 8 fillér for industrial milk(41). The stabilization of milk prices gives an insight into the whole contemporary organization of milk production and consumption and that is why we discuss it in some detail. The fact that instead of a nation-wide adjustment of milk prices only "regional" price adjustments were carried out, where the interests of large-scale farms were first asserted again – is characteristic.

Budapest, the capital of the country, was the largest consumer's market. This relatively closed uniform area had the advantage of being rather easy to manage. The owners of large estates attempted, therefore, to monopolize the relatively reliable markets of the capital, as they represented an important outlet for them even in the case of decreasing consumption. In smaller towns milk consumption was insignificant; a big proportion of the population kept cows even in great towns (the poor had goats in many places) and the demand was low. The Budapest market was thus the only important outlet. So after 1929 the owners of large estates insisted on "settling" the question of milk market by withdrawing the market of the capital from the increasing competition. In September 1931 a decree was issued which charged the Ministry of Agriculture with the task of establishing the producer's and consumer's prices of milk, and tried to make the dairies more profitable by preventing the establishment of new ones and amalgamating the existing ones. Following this step, in 1932 the capital was declared a "closed area". According to the orders only those producers were allowed to deliver milk to Budapest, who had been regular suppliers from 1 April 1931 to 31 March 1932. Members of the Budapest Association of Milk Producers had this right too. At the same time quotas were determined for the milk delivered. The price of milk was established officially, and this is where the other main point of the system lies: it was through this that the government tried to stop the fall in prices and ensure a considerable profit to those sharing in the contingent, as a matter of course, to the owners of large estates. (Between January and September 1934 an overwhelming part of the milk transported to Budapest was supplied by farms larger than 60 ha, and 36·82 per cent by ones above 600 ha!)(42)

Milk prices continued to drop all over the country except Budapest, which was caused by a decrease in the price of butter. It was mainly exported butter that became much cheaper, and since butter was mostly produced for export, it fundamentally determined the trend of the whole milk problem. Namely, the government attempted to subsidize the export of butter and in certain periods the price support was almost fifty per cent(43) all this proved, however, insufficient. The largest estates were not, naturally, affected by the fall in prices, as they could sell most of the milk in the closed Budapest market at a very high price. This resulted in a great tension; the population of the capital insisted on a price reduction (in 1932 the consumer's price of milk was 34 fillér per litre in Budapest, at the same time farmers in the country only got 8–12 fillér for one litre of industrial milk), and the producers, first of all the peasantry – who did not share in the profit – on the reopening of the closed area. The government did not of course remove the monopoly but attempted to draw certain peasant strata into the marketing activity. In May 1933 a new decree was issued which suppressed the milk deliveries of small peasant producers in the neighbourhood of Budapest who delivered less than fifty litres a day, and forced them to enter co-operatives and excluded retailers from the trade, who were not producers after paying them compensation. The decree also stopped the direct activity of landowners who delivered less than 500 litres a day and from then on they delivered milk through the Budapest dairies(44). However, those who entered the co-operatives had better possibilities than before. That their share in selling milk still did not grow considerably is shown by the above data. No doubt, however, the upper layers of the peasantry which could deliver 20–50 litres of milk a day received a share of the profit of monopoly prices from then on(45).

The consumption of milk still continued to decrease, so under the influence of the crisis a certain readjustment of production had to be carried out, inasmuch as from the thirties butter production and mainly butter exports played an increasing role(46). So in this field the crisis undoubtedly had a positive effect, namely, it promoted reorganization of production. The state policy – often deliberately, often only for economic reasons – gave preference to the large estates, and only the uppermost strata of the peasantry at the most had a slight share.

Notes

(1) Compiled on the basis of published data and questionnaires of useful animal censuses. See further: National Archives: Preparation of peace.

(2) In 1942 the cattle stock grew to 2·37 million (Éber: op. cit., 430 and Konkoly-Thege: op. cit., 175), but even so it did not reach the 1920 level.

(3) On the basis of spring registrations of useful animals. National Archives: Preparation of peace.

(4) The increasing role of Transdanubia in cattle farming was recognized by Éber too (op. cit., 432) who did not, however, study the differences existing then in Transdanubia. For certain counties of Southern Transdanubia see I. Király: A szarvasmarhatenyésztés fejlődése Tolna megyében (Development of cattle farming in Tolna County). Agrártörténeti Szemle, 1968, 486–513.

(5) Major farm data on Hungarian agriculture in 1935 according to farm size (Magyar Statisztikai Közlöny, New Series, Vol. 112, Budapest, 1941).
(6) Mezőgazdasági Adattár, Vol. II (Budapest, 1965). 134 and 137.
(7) Magyarország földművelésügye . . . (Agriculture of Hungary . . .) 1931, 59. In 1927 only from 1567 (81·5%) farms. Magyarország földművelésügye . . . 1927, 61.
(8) Attempts to rear draught oxen were made here even earlier, especially at the beginning of the twenties, but in no considerable dimensions. O. Wellmann: Szarvasmarhatenyésztés (Cattle Breeding). Budapest, 1925.
(9) On the basis of the relevant volumes of "Magyarország földművelésügye", the Hungarian Statistical Year-Books and data of National Archives: Preparation of peace. See further: Á. Ujlaki Nagy: Élelmiszertermelésünk és ellátásunk (Production and Supply of Food in Hungary). Budapest, 1943. 239–298 and J. Csorba: Értékesítő Szövetkezetek a mezőgazdaságban (Marketing Co-operatives in Agriculture). Sárospatak, 1941, 52–53.
(10) See among others: Á. Ujlaki Nagy: op. cit., 76.
(11) For the 1930 survey see: Magyarország földművelésügye . . . (Agriculture in Hungary . . .) 1930, 42 and 1931, 18. Annual milk yield in litres: Magyar Statisztikai Szemle, 1935, 356.
(12) On the basis of quarterly reports by the Hungarian Institute of Farm Researches. According to Varga and Matolcsy the average milk yield was 1500 litres in 1924, 1800 litres in 1929 and 1820 litres in 1937. (Cf.: Matolcsy–Varga: The National Income of Hungary 1924/25–1936/37. London, 1938, 17.) By another calculation the milk yield of red-spotted cows was 1500, that of the grey Hungarian breed 900 and the milk production of badger-coloured cattle 1800 litres in 1927 (F. Fellner: Csonka-Magyarország nemzeti jövedelme [National Income on the Post-war Territory of Hungary]. Budapest, 1930, 30). According to a different source in 1938 the milking average was 1780 litres. Mezőgazdasági Közlöny, 1938, 33.
(13) P. Batta: Magyarország elit-tehenei az 1927–1931. években (Elite Cows of Hungary in 1927–1931). Budapest, 1932. By the same author: Szarvasmarhatenyésztésünk újabb eredményei az Elit-tehenekben (Recent Results of Hungarian Cattle Breeding in the Elite Cows). Budapest, 1936, 9 and sqq. See further: Trianoni Magyarország Mezőgazdasága (Agriculture in Post-war-Hungary) II, Budapest, 1941, 525–526.
(14) Same author, and National Archives: Preparation of peace.
(15) See both of Batta's cited works. The fat content of milk produced by the peasant stock was generally higher than that of the larger dairy-farms where the higher averages resulted in some decrease in fat content.
(16) P. Batta: Szarvasmarhatenyésztésünk újabb eredményei az Elit-törzskönyvben (Recent Results of Hungarian Cattle Breeding in the Elite Herd-book). Budapest, 1936, 12 and 21.
(17) The results of herd-book registration are excellently summarized by Konkoly-Thege: op. cit. 98–109 and on this basis Éber: op. cit., 437–438. A development is indicated also by the fact that of the two publications presenting the elite hord-books (see note 13) the former runs to 72 while the latter to 257 pages!
(18) For the numerical data see Éber: op. cit., 437.
(19) The purchases are followed by the annual OMK reports and the relevant volumes of "Magyarország földművelésügye . . .", especially 1919–1922, 19–20; 1923–1925, 17; 1926, 15; 1927, 13, 55 and 1928, 16. See further Éber: op. cit., 436.
(20) Konkoly-Thege: op. cit., 51. Annual OMK reports.
(21) Konkoly-Thege: op. cit., 104–105. See further the relevant volumes of "Magyarország földművelésügye . . ." and the annual OMK reports.
(22) Idem. and OMK 1933, 79–80. For the attempts given up see: OMK 1937, 83.
(23) Éber: op. cit., 425–426. For meat weights see: Á. Ujlaki Nagy: op. cit., 71.
(24) Konkoly-Thege: op. cit., 135.
(25) The relevant literature generally does not pay much attention to this. The damages caused by this were, however, regularly underlined by the sub-prefects and agricultural

supervisors of the counties in the first half of the twenties. (Documents of O. L. F. M. Farm Inspectorates and quarterly reports of Subprefects, idem.)

(26) See Konkoly Thege: op. cit., 74.

(27) Magyarország földművelésügye . . . Vol. 1925–1928.

(28) Annual OMK reports.

(29) Máté: op. cit., 169, annual OMK reports.

(30) On the basis of data published in the annual OMK reports.

(31) On the basis of spring registrations of useful animals in the annual OMK reports.

(32) On the basis of spring registrations of useful animals and National Archives: Preparation of peace. See further: 1938 OMK reports.

(33) On the basis of data contained in the Hungarian Statistical Year-Books.

(34) See Buzás: op. cit., 30–33.

(35) Szuhay: op. cit., 127.

(36) Szuhay: op. cit., 127. Cattle fattened by the peasantry reached Germany only after 1935. L. Szecsányi: Mit végzett a Hangya nyolc év alatt az állatértékesítés terén? (What did the Hangya Marketing Co-operative attain in eight years in the field of livestock marketing?) Budapest, 1940, 13.

(37) Szuhay: Idem.

(38) Szuhay: op. cit., 206.

(39) For all this see Szuhay: op. cit., 206–214.

(40) Idem. 206 and 210. See further: Wünscher: op. cit., 231–234 and Hegedüs: op. cit., 52–61.

(41) Éber: op. cit., 447. Matolcsy–Varga: op. cit., 96. The trend of market conditions was followed by the annual OMK reports too.

(42) For details of the question see Szuhay: op. cit., 446–447. Law decrees in detail in E. Solty: Budapest tejellátása (Milk Supply to Budapest). Budapest, 1936, 16–37 (Főv. Stat. Közl.). For data on deliveries in 1934 see Solty: op. cit., 51. From the viewpoint of trade but with adverse feelings toward the large estates: annual reports of the Budapest Chamber of Commerce and Industry entitled "Commerce and Industry of Hungary in 1932 and 1933". With special hostility toward dairy farms ("asphalt milk-farms"). See further Wünscher: op. cit., 214–217. B. Balázs: Milimári veszedelem (Danger of Milk-trader maids). Budapest, 1935. L. Lipták: A tejpiac közérdekű rendezése (Organization of the milk market with a view to public interest). Budapest, 1934. B. Löcherer: Az ipari tej értékesítése (Marketing of Industrial Milk). Budapest, 1934. By the same author: A tejkérdés igazi arculata (True Aspect of the Milk Problem). Budapest, 1932, etc.

(43) Exactly 46·7 per cent. Szuhay: op. cit., 131. For the butter problem see: Tej- és vajforgalmi és értékesítési adatok az 1932–1934. évekről (Data on the trade and marketing of milk and butter for 1932–1934). Budapest, 1935.

(44) Szuhay: op. cit., 132–133.

(45) It is interesting to compare the adjustment of milk prices and milk market in Hungary with the way it happened in England at the same time. It was undoubtedly the English model that gave inspiration as to the methods of settling this question. The structure of land property in Hungary and the social and political relations of the owners of large estates, on the other hand, distorted these methods from the beginning.

(46) See relevant data of Table 128 and Szuhay: op. cit., 136. The development of dairy co-operatives was noteworthy, especially between 1929 and 1938, that is, it reflects again the effect of the crisis. In 1923 one million litres of milk were sold by ten co-operatives with a total of 627 members, in 1928, 11 880 000 litres by ninety-nine co-operatives with 15 242 members, in 1929, 16 770 000 litres by 129 co-operatives with 17 474 members, and in 1938, 183 751 830 litres of milk (!) by 873 co-operatives with 119 750 members. B. Ghyczy: Szövetkezetek a magyar mezőgazdaságban (Co-operatives in the agriculture of Hungary). Budapest, 1948, 145.

Chapter 10 Horse farming

When studying the trend of horse farming, taking the period as a whole, the stock showed some decrease rather than increase in numbers. This cannot, however, be explained by the special conditions of Hungary alone. It had much broader correlations, namely, the large-scale mechanization of agriculture after the First World War, which in a few decades almost "wiped out" the horse stock in all the countries where agriculture was at a relatively high level of development. The fact that the number of horses in Hungary decreased but slightly and remained roughly the same during this period of twenty years shows the backwardness of Hungarian agriculture compared to Western Europe and North-America. Mechanization was not profitable in Hungary; due to cheap manpower and draught power which did not require any expenditure, since farms utilized their own feedstuffs, the use of machines spread almost exclusively in the large estates, and even there not in all branches. So preservation of the horse stock in the given framework indicates that development came to a standstill, with only some changes in proportions. However, let us see the data first (Table 35).

Thus the stock – the first and last series of data considered – was by and large unchanged, and yet considerable changes occurred during the nineteen years discussed. The annual average of the horse stock was about 826·2 thousand for the whole period and within this the number of horses was generally higher in the twenties (829·6 thousand) than in the thirties (822·6 thousand), although the difference was only seven thousand, that is, 0.8 per cent of the total stock. All this would suggest a stableness if the curve between the two roughly identical data did not show a constant fluctuation. So it is not surprising that in the early twenties the stock grew generally. We can accept this even when considering that there were no regular surveys made before 1924, and the statistical data of that period are more deficient than usual. The stock overused during the war increased in the first peaceful years until it reached the level determined by the demands. This growth of the stock was not influenced either by difficulties of marketing, or by the problems of feeding. This suggests that it was a process of overwhelming force, a matter of satisfying fundamental needs, and not a case of favourable changes in the economic conditions. The growth was so vigorous that one tends to think the temporary stagnation in 1922 and 1926 to have been a statistical error rather than a decline in the stock. As a result of this even progress the number of horses increased by 1929 from an initial 738 thousand to more than 918 thousand; the growth was thus enormous – in the very period when the economic conditions were favourable for mechanization in Hungary too! Between 1920 and 1924

Table 35. Trend of the number of horses from 1920 to 1938 on

Year	Total stock	Warm-blooded	%	Cold-blooded	%	Foal (younger than 3 years)			
						male	%	female	%
1920	738·0	—	—	—	—	—	—	—	—
1921	748·0	—	—	—	—	—	—	—	—
1922	717·5	—	—	—	—	—	—	—	—
1923	814·9	—	—	—	—	—	—	—	—
1924	849·7	660·8	77·8	189·1	22·2	62·7	7·4	114·9	13·5
1925	875·9	682·0	78·8	133·8	22·2	59·6	6·9	114·3	13·0
1926	884·7	693·6	78·4	191·0	21·6	59·5	6·7	109·0	12·4
1927	903·3	705·6	78·1	197·7	21·9	54·5	6·0	102·8	11·4
1928	918·1	725·5	79·0	192·5	21·0	50·2	5·5	97·9	10·7
1929	892·2	708·1	79·4	184·1	20·6	41·4	4·6	85·7	9·0
1930	860·4	682·9	79·4	177·5	20·6	34·3	4·0	75·1	8·5
1931	864·5	694·7	80·3	169·8	19·7	27·7	3·2	60·2	7·0
1932	845·5	654·0	79·3	171·5	20·7	30·4	3·6	57·0	6·7
1933	819·9	658·8	80·3	161·0	19·7	31·4	3·8	57·5	7·0
1934	802·9	641·9	79·9	161·1	20·1	26·7	3·3	52·7	6·7
1935	804·1	642·9	80·0	161·2	20·0	31·6	3·9	57·8	7·2
1936	794·3	631·1	79·5	163·2	20·5	37·9	4·8	67·3	8·5
1937	798·0	630·4	79·0	167·7	21·0	40·6	5·1	75·8	9·5
1938	813·5	642·5	79·0	171·1	21·0	38·2	4·7	75·0	9·2

the number of horses may be put at 772·4 thousand on an average, but from 1925 to 1929 the annual average increased to 886·8 thousand which in itself indicates the rapidity and great intensity of growth.

The decrease of the stock began after 1928, that is, under the pressure of the economic crisis, and took place with almost the same consistency and force as the growth. From 918·1 thousand in 1928 the number of horses dropped to 798 thousand by 1937 – that is roughly the level of the twenties. This decrease – as suggested by its even course – could hardly be a mere problem of selling as in the case of fluctuations in the cattle stock. The even gradual decrease is shown by the averaged data too. According to these, the number of horses was 838·5 thousand between 1930 and 1934, and 802·5 thousand between 1935 and 1938 on an annual average. This decrease could only be stopped at the end of the thirties by the strained international situation. The horse stock began to grow then through financial allowances owing to the military preparations(2). This was why, in 1938 the stock showed a slight increase again. However, this was an external cause which could not be permanent and could not later prevent the horse stock from being reduced to a minimum. The army itself was getting mechanized – even if to a lower extent in Hungary than in other parts of the world –, and so the rapid decrease in the number of horses after 1945 could not be stopped.

By following the structural changes in the horse stock we obtain an extremely characteristic picture. As the first surprising fact, parallel to an increase, then a decrease in the total stock the number of foals gradually decreased after 1924 (earlier data are not available) from 223·8 thousand to 106·9 thousand by 1934

the basis (in thousands) of sping registrations of useful animals(1)

				Fully grown							
castrated	%	Total	%	male	%	female	%	castrated	%	Total	%
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
46·2	5·4	223·8	26·3	19·4	2·3	397·2	46·7	209·3	24·7	625·9	73·7
46·2	5·2	220·1	25·1	20·2	2·4	414·3	47·2	221·3	25·3	655·8	74·9
44·4	5·0	212·9	24·1	20·3	2·3	420·9	47·6	230·7	26·0	671·7	75·9
43·7	4·8	201·0	22·2	18·7	2·1	434·8	48·1	248·8	27·6	702·3	77·8
43·7	4·8	191·8	21·0	18·3	2·0	445·4	48·5	262·6	28·6	726·3	79·0
39·4	4·4	166·5	18·6	16·7	1·9	441·1	49·4	267·9	30·0	725·7	81·4
35·6	4·1	143·0	16·6	12·5	1·4	232·0	50·3	272·3	31·7	616·8	83·4
29·8	3·4	117·7	13·6	10·9	1·3	446·2	51·6	289·7	33·5	746·8	86·4
25·8	3·1	113·2	13·4	9·1	1·1	435·7	51·5	287·5	34·0	732·3	86·6
25·7	3·1	114·6	13·9	8·0	1·0	418·6	51·1	278·7	34·0	705·3	86·1
27·5	3·4	106·9	13·4	7·5	0·9	412·1	51·3	276·4	34·4	696·0	86·6
28·5	3·5	117·9	14·6	6·9	0·9	408·0	50·7	271·3	33·7	686·2	85·4
31·4	4·0	136·6	17·3	7·1	0·9	389·1	49·0	261·5	32·9	657·7	82·6
38·2	4·8	154·6	19·4	7·3	1·0	381·6	47·8	254·5	31·9	643·4	80·6
39·7	4·9	152·9	18·8	7·8	1·0	389·3	47·9	263·5	32·4	660·6	81·2

(the decrease was thus more than fifty per cent compared to 1924!), while the number of fully grown horses showed a great increase until 1931 reaching 764·8 thousand by that time compared to 625·9 thousand in 1924. So in spite of a reduction in numbers later, the proportion of fully grown horses within the total stock grew from 73·7 per cent in 1924 to 86·6 per cent by 1934, and even in the second half of the thirties it never dropped below 80 per cent. At the same time the proportion of the young stock gradually decreased from 26·3 to 13·4 per cent, indicating that in the twenties and thirties the main objectives of breeding were not reproduction and marketing. The only aim was to maintain the stock at a necessary minimum. At the same time, the tendency of the second half of the thirties, the increase of the stock in 1938 was forecast by an earlier change in the situation in 1934–35 when the number of foals began to grow thus laying the foundations for a general increase in the number of horses—as proved by the statistical data of

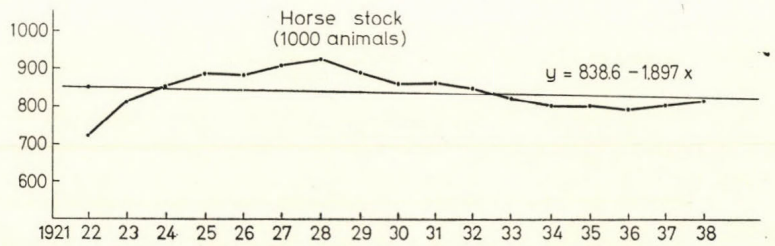


Fig. 26. Trend of the horse stock, 1922–1938

1938. It must be emphasized, however, that the decrease in the number of foals and the increased proportion of fully grown horses between 1924 and 1934 was not only due to the general economic conditions. It was not primarily under the influence of marketing tendencies that the horse stock, and especially the young stock, developed, but under the pressure of a generally accepted rule concerning questions of marketing or feeding and which determined the development of the whole period. This is confirmed by a study on the stock of mares, since most mares were not used for breeding but employed in production. In the case of fully grown and young horses the proportion of females underlines the conclusions drawn on the total young and fully grown stock. And yet, an overwhelming part of the mares was – as said before – utilized in production.

The reduction in the number of fully grown young stallions seems to have been much alike. The number of colts decreased by more than 50–55 per cent, while the stock of stallions was reduced to a much greater measure, from 19·4 thousand to less than eight thousand. Accordingly, the proportion of stallions fell from 2·3 to less than one per cent, while that of colts from 7·4 to 3·5–4 per cent. This decrease reflects partly a lessened zeal for breeding, partly the effect of an agricultural policy aimed at eliminating the unregistered stallions especially in the twenties but also nearly throughout the whole period(3). The increased proportion of fillies in the total young stock suggests again a lessened zeal for breeding; this only improved when the total young stock began to grow after 1934.

On the whole, the horse stock showed a steady character of breed which did not essentially change in the period concerned. In 1924, 77·8 per cent of the total stock was warm-blooded and 22·2 per cent cold-blooded; in 1926 the warm-blooded stock began to grow, and even after 1929, when the whole stock of horses was decreasing, its decrease was slower and less even than that of the total stock and of the number of cold-blooded horses, respectively. As a consequence, in 1933 the cold-blooded stock fell to 19·7 per cent, and only rose again above 20 per cent in 1934–36 because it stopped decreasing in number while the number of warm-blooded horses continued to fall. Finally, the proportion of the cold-blooded stock stopped at about 21 per cent. Thus, it was not primarily the change in the character of breed that in that period determined the improvement of quality in the horse stock.

As to the regional distribution of the horse stock, the problem was studied with the same method as in the case of the cattle stock. The results of investigation did not, however, show the same difference. The horse stock – as already seen in the general study of its numbers – is much less sensitive to marketing problems; it is mainly influenced by farm conditions (draught work). The distribution of the stock is also more even, as shown by Table 36: in 1924, 50·12 per cent was found in the Great Hungarian Plain, 11·94 per cent in the northern part of the country and 37·94 per cent in Transdanubia. The density of the horse stock was thus somewhat higher in the Great Plain than in Transdanubia, but the difference was not so great and we could say that the horse stock showed roughly the same density all over the country. But let us see the data.

Table 36. Distribution of the horse stock (in thousands) in the regions of Hungary between 1924 and 1938(4)

Regions	1924	1925	1928	1931	1934	1938
Transdanubia	321	326	337	314	289	304
Great Hungarian Plain	424	442	465	440	411	409
Northern Hungary	101	104	113	108	98	99
Hungary total	846	872	915	862	798	812

The table shows that the situation was static; the reduction of the number of horses did not result in any substantial difference between the regions. According to data of the Table none of the regions was more important with respect to breeding than the others (which does not mean that we disregard the more developed breeding traditions of one or the other region), and we cannot say either that the proportions changed essentially. The above distribution among the regions remained almost unchanged. In 1938 50·37 per cent of the stock was in the Great Plain, 37·44 per cent in Transdanubia and 12·19 per cent in the northern areas. And when we consider the 1934 situation – i.e. examine the horse stock in the state of decrease – we find, essentially, similar conditions, only the share of the Great Plain and the northern areas was slightly larger (the difference did not even amount to one per cent in either of the two) indicating that the number of horses was decreasing at a somewhat faster rate in Transdanubia than in other parts of the country. But this difference in the rate of decrease was so slight that we can safely neglect it. (By 1938 the horse stock became five per cent smaller in Transdanubia, and decreased by four and two per cent in the Great Plain and in the North, respectively. The decrease was only four per cent on a national scale.) This was similar everywhere, which – and this is not surprising either – does not change when we examine the period of increase rather than of decrease.

In 1928, i.e. toward the end of the period of growth, fifty per cent of the stock fell to the Great Plain, 12·35 per cent to the northern part of the country and 36·83 per cent to Transdanubia. Growth in the Great Plain was thus somewhat faster than the national average and especially increased the proportion of northern areas. Transdanubia was less responsive to the changes. If any conclusion can be drawn at all from all this, it is the following: besides a relatively uniform distribution of the horse stock in the Great Plain, particularly the northern hilly areas required a higher number of horses than Transdanubia, where mechanization generally was at a more advanced stage. In the former two regions it would have been more difficult to exclude the horse from production. In the northern hilly areas the maintenance of draught power utilization was made necessary by the topographical conditions too, while in the Great Plain, owing to bad roads and the scattered settlement pattern of detached farmsteads it was of vital importance for the farms to have appropriate transporting facilities at their disposal. And this could only be attained by the use of the horse, since the general level of economic development did not permit the introduction of the necessary machines and motor vehicles.

In the horse stock of Hungary the character of breed – as seen above – did not substantially change in the period concerned. Thus, if we examine the qualitative development of the stock, other factors must also be taken into consideration, for example the tendency to give priority to Nonius, a draught horse breed of better economic efficiency, and not without any effect. A numerical assessment of such breeds is, however, extremely difficult, as the necessary comparative data are almost completely missing. In a sense, consolidation of the new breeding districts developed after the war(5) and establishment of a breeding organization able to convey the scientific results to the practice of breeding(6) can likewise be regarded as the improvement of quality. The most important of all this is, however, the fact that with pertinacious efforts the quality of state-owned stud farms was improved.

Sire supply in horse breeding plays a special role. Namely, the owners do not have every mare covered, and accordingly most of them do not have stallions. The question will be quite clear if we examine the distribution of sires.

Even at the beginning only 12·1 per cent of the mares was owned by those who at the same time had stallions of their own. However, this proportion soon decreased to six per cent when the crisis was at its worst (1932–33), then, when the stock was increasing again the mare stock owned by those who had stallions of their own grew to some extent too, but never again did it exceed 7·3 per cent. So 92·7 (in certain years 94) per cent of the total stock had no stallion of their own, which makes it important to study the stud-horse supply. Those who had stallions of their own possessed only six or seven per cent of the total mare stock from which it logically follows that most of the stud-horses were stallions hired to cover the mares of the district. For this very reason the realization of the breeding policy of the government through an improved supply of stud-horses was of great interest. The government was in this case in a unique position, since it was able to influence the quality of the stock through the supply of stallions to such an extent as in no other animal species.

The number of stallions was reduced from 7600 to 3600 by 1938, though there were periods when it did not even reach 2900(7). On the basis of this trend we can safely say that the number of stallions was far from sufficient, although the decrease in itself cannot be regarded as a purely negative feature, since it accompanied the fight against the use of unregistered stallions which, in turn, was a basic precondition of a qualitative improvement. True, results could only be attained with stallions of suitable quality available. In this field almost everything had to be started anew after the war. The trend of the proportion of stud-horses used in common breeding reflects the whole process. In the twenties, up to 1930, their proportion was about thirty-four per cent and their numbers ranged between 2400 and 2600(8). But the data do not show the blunt fact that the consequences of the post-war changes of frontiers proved catastrophic in this field.

The new borders meant an enormous loss both in the horse stock and in the staff(9). The stock could be replaced, though, in some way or other, but a part of the tenders of stud-farms remained outside the new borders. In the absence of an adequate staff the mating stations had to be closed and the state stud-farms left

were let by lease to private contractors(10). This was of course but a temporary solution, but it caused a tremendous loss, since leasing out involved the complete relaxation of the breeding discipline. It did not do much harm to the horse stock of large estates, but may have resulted in a considerable deterioration of the peasant horse stock. This was prevented by the breeding policy of the government when stud-farms and mating stations were organized again as a sign of stabilization(11). From 1921 the studs and stud-farms were gradually nationalized. Re-establishment of stud-farms at a faster rate started in 1925–26. First three, later on ten of them functioned in the country (three in Transdanubia, two in the Danube–Tisza Interfluve, one in the North, and four in the Great Hungarian Plain). The progress – as seen from Table 36 too – was very intensive, since by developing a new breeding centre in the Great Hungarian Plain almost from nothing, Hungary succeeded in slowly making up for the loss, re-establishing the breeding discipline and improving the quality of the stock. Under the influence of a constant development the proportion of stallions used in common breeding slowly became higher. 1930 can be considered to have been the year of change when the ratio of stallions used in common breeding rose above forty per cent. True, this number decreased after 1928, but after stagnating at about 1300, it began to grow again at a rapid rate in 1937–38. Nevertheless, in the thirties, when the number of privately owned stallions started to drop, their proportion never fell below 40 per cent, and in 1935–36 it even increased to 56·5 per cent, that is, the larger part of the stock was then used in common breeding.

Preference given by the governmental breeding policy to the warm-blooded stock slowly shifted toward the cold-blooded breeds. This is evident from the more rapid rate of decrease displayed by the warm-blooded stallions compared to the cold-blooded stock, but is also seen from the fact that the proportion of the cold-blooded stock used in common breeding did not grow to such an extent as that of the warm-blooded stock. Of the cold-blooded stud-horses the ratio of the common breeding stock grew from 36·5 to 45·2 per cent in fifteen years, while in the warm-blooded stock this proportion almost redoubled (from 33·5 to 60·4 per cent). The fact that the warm-blooded stud-horse stock of larger farms was reduced to a quarter in the same time accounts for it in part. This decrease did not, however, influence the breeding policy of the government, only made it more marked.

It is not easy to answer the question whether the number of stud-horses was sufficient to meet the requirements, and whether any improvement in this field can be spoken of (Table 37).

In 1938 the average ratio of stud-horses to mares was 1 : 106–107, which in itself is a rather bad ratio; however, the trouble was that a large part of the mares was not generally taken to horses, only we do not know how large this part was. So we are compelled to rely upon general estimates according to which the situation undoubtedly improved. While at the beginning of the thirties the number of mares taken to state-owned stud-horses was 60–70 thousand, this figure was 87 thousand in 1937 and 92 thousand in 1938 (which means that the average ratio of stud-horses to mares was 1 : 46 in 1938).

Region	Warm-blooded		Cold-blooded	
	common breeding	private	common	private
Transdanubia	264	22	145	20
Great Hungarian Plain	154	15	632	15
Northern Hungary	268	13	94	13
Hungary total	181	18	154	18

Table 37. The 1938 number of mares per stallion in the different regions of Hungary(12)

The cold-blooded stock was concentrated in Transdanubia (64 out of 73 thousand mares were in Transdanubia), and within this mainly in Southern Transdanubia. Of the total stock of cold-blooded mares in Hungary 75 per cent was in the counties of Baranya(13), Somogy, Vas and Zala! In Somogy County alone more than 23 000 cold-blooded mares were kept. The coincidence of the major cattle breeding regions with the breeding districts of cold-blooded horses is apparent. In these counties actual breeding work was done and this is confirmed by the fact that an overwhelming proportion (442 out of 476, i.e. more than 92 per cent) of the common breeding stock of cold-blooded stallions was also concentrated in this region. And even within this, the dominance of the above four counties is outstanding (344 out of 442 stallions). In the northern areas of Transdanubia, along the Danube there were hardly any stallions in common breeding.

The other breeding centre of cold-blooded horses was in the northern part of Hungary, in counties Heves, Borsod, Nógrád and Zemplén. In this region the ratio of common breeding stud-horses to cold-blooded mares was 1 : 94. The relatively favourable ratio in itself shows the extensive practice of breeding. The Great Hungarian Plain, on the other hand, cannot at all be regarded as a breeding district for cold-blooded horses. The ratio of common stud-horses to mares was 1 : 632 (!). In Pest County e.g. there was only a single cold-blooded stallion.

With respect to warm-blooded horse breeding, the Great Hungarian Plain was undoubtedly in a more favourable position with its highest stallion–mare ratio on a national scale. Transdanubia was much more unbalanced in this respect, and also in the North, the tension was greater than in the Great Plain, where only the towns were in a less favourable position.

All this provides an opportunity for drawing the outlines of breeding districts. In the opinion of contemporaries, too, there was a certain development shown in horse breeding, especially when quality is concerned(14). With the stud-farms built up, the breeding and feeding conditions of the common stock improved very much. It was due to this as well as to culling that the degree of utilization increased in the stock. Mating from hand was provided for here, and this was a considerable advantage, too. In addition, the quality of stallions improved as well. In this field horse-breeding played a leading role, and such a great progress as made here hardly took place anywhere else. It is very difficult to present it by numerical data, but progress was beyond question(15).

Parallel with breeding there was a development in veterinary practice, too. The agricultural policy of Hungary achieved highly important results in this field as

well. The number of horses which had died of epizootic diseases had not been high anyway as it had never exceeded 0·7–0·8 per cent. By the middle of the twenties this proportion fell to 0·25–0·35 per cent, and in the thirties it was only 1–2 thousandths. The number of perished or slaughtered horses was about 180–240 a year, which shows a great discipline and a considerable development as regards animal hygiene(16). This was undoubtedly a great achievement of the state's breeding policy.

During the crisis state control was extended to *horse marketing* as well. Only some of the horse owners were, in fact, concerned in this, especially – though not exclusively – the owners of large estates, since the state regulation was restricted to export which hardly affected the peasants. Initially attempts were made to exclude the wholesale trade to enable the breeders to avoid, to some extent, the consequences of the fall in prices. The aim was to ensure a minimum price; when distributing the export quotas the Ministry of Agriculture determined the minimum price to be paid(17). Some price regulating role was likewise played by the Ministry of Defence too in raising the price of two-year-old foals (by 150 per cent!) in 1935. It had consequences in the growth of the stock – especially of the young stock – after 1935. Monopolization of the stud-horse export to Germany and Czechoslovakia (to Austria mainly slaughter horses were exported) meant a further step. At the same time the price paid for horses exported to other markets was checked too. It is difficult to decide whether the increase in horse prices was due to these measures, or to the general military preparation. The latter was in all probability the decisive factor, particularly from 1938 on. The decreased export after 1937 served the purposes of military policy; from 1938 the export of warm-blooded horses was stopped(18).

The horse breeding owners of large estates whose incomes were seriously affected by the ban, tried to protest, though with not much result; still, the years following 1936 were characterized by an increase in horse prices. In 1937 the prices exceeded by 25 per cent the 1929 level, while the average price of livestock products was only 65–66 per cent higher. Thus, the loss of a vast income surplus owing to the decrease of exports rather than the general situation was the cause of the complaint, as indicated, otherwise, by the increased number of horses by 1938 too.

The government intervention – though intensive on the one side – was not extended to the whole branch of horse breeding to such a degree as in other cases. The reason for this was that other operative conditions were the decisive factors in horse breeding and maintenance. Measures taken by the government were only aimed at ensuring a somewhat higher price for the horse stock placed on the market than what could have been attained otherwise. Although the interests of large estate owners may have played a considerable role in it, there is no doubt that especially in the first half of the thirties the interests of breeding had to be kept in view above all.

Notes

(1) On the basis of spring registrations of useful animals. See the annual reports of OMK and the statistical tables of spring registrations of animals. (O.L.F.M.) and National Archives: Preparation of peace.
(2) Summarized by Szuhay: op. cit., 214–215.
(3) For this extremely difficult fight see the reports of county and district farm inspectorates, especially until 1927. Referred to also by Éber: op. cit., 479–480.
(4) On the basis of spring registrations of useful animals, and National Archives: Preparation of Peace.
(5) For the consolidation of breeding districts see Máté: op. cit., 210–221. Trianoni Magyarország mezőgazdasága (Agriculture in Post-war Hungary). Vol. II, Budapest, 1941, 537. See further Éber: op. cit., 476–478. (Éber does not, otherwise, attach any importance to the consolidation of the breeding districts because he has not studied the detailed data.)
(6) Idem. and annual OMK reports.
(7) On the basis of data presented in the annual OMK reports.
(8) On the basis of spring registrations of useful animals. Cf. Éber: op. cit., 480, and annual OMK reports.
(9) Losses occurring in this field are summarized by Éber: op. cit., 474. Cf. D. Laky: Csonka-Magyarország megszállásának közgazdasági kárai (Economic Damages Caused by the Occupation of the Mutilated Hungary). Budapest, 1923, 236. Trianoni Magyarország mezőgazdasága (Agriculture in Post-war Hungary). Vol. II, Budapest, 1941, 535.
(10) Magyarország földművelésügye az 1919–1922. évben (Agriculture of Hungary in 1919–1922). Budapest, 1927, 19–20 and Éber: op. cit., 479. As a result of leasing out the owners of mares had their mares covered mainly by uncontrolled stallions, as the price of mating was very high.
(11) From 1921 the state management was gradually restored: Magyarország földművelésügye . . . 1919–1922, 20. The re-establishment of stud-farms started at a higher rate in 1925–26. Magyarország földművelésügye . . . 1927, 15. First three, later ten stud-farms were functioning (Székesfehérvár, Nagykanizsa, Komárom, Nagykőrös, Baja, Békéscsaba, Hódmezővásárhely, Debrecen [two], Jászberény). Leasing was suppressed simultaneously. The number of mating stations grew from 190 in 1927 to 458 by 1938. Éber: op. cit., 479–480.
(12) Data of spring registrations of useful animals, and National Archives: Preparation of peace. See further: Annual OMK reports, 1938.
(13) Cf.: L. Sziebert: A hidegvérű lótenyésztés Baranyában (Cold-blooded Horse Breeding in Baranya County). Pécs, 1943.
(14) See the works cited in note 5.
(15) A comparison of the annual OMK reports clearly shows the development in this field. —We mention here the training courses on horse-shoeing organized to improve the utilization of the horse stock. OMK, 1937, 84.
(16) On the basis of data of the Hungarian Statistical Year-Books.
(17) Szuhay: op. cit., 214.
(18) Idem. 213–216. For the boom of 1935–37 see OMK, 1937, 84. For marketing in general see Wünscher: op. cit., 242–246 and Hegedüs: op. cit., 90–102.

Chapter 11 Pig farming

It is undoubtedly the pig stock that shows the highest rate of fluctuations as an animal species extremely responsive to a great variety of factors, and among these not in the least to changes in the economic conditions. In the early thirties, at the time of reduced fodder imports, it reacted to the trend of fodder yields too, the effect of which was naturally felt in feed prices. The pig stock was affected by infectious diseases, above all by the recurring swine-fever. So it is not surprising that there are much greater fluctuations than before (Table 38).

It should be stressed, however, that there is a great possibility of error in the animal census of the pig stock, so these data must be treated with precaution. The deviation may even be 50 per cent or more, and we cannot even say with absolute certainty – although generally it is so – that the data presented here give the minimum stock. When evaluating the data concerning the pig stock we must not resort to the conventional method; there were years when the stock may have been much larger, or smaller than shown by the data of Table 38, especially at the peak of the swine-fever (in 1931–32), but on other occasions too. Further, we have to take into consideration that pigs may farrow twice a year, so for a 70–90 kg English porkling to have been slaughtered without ever being recorded in the statistics may have been quite regular. Nevertheless, we can rely on the data of the table, partly because the absolute numbers can be evaluated in comparison with one another, that is in normal years the percentage error of the census must have been roughly the same, partly because the data of the table make the distribution of pigs over the area of the country sufficiently clear (since the errors of registration must have been rather uniform all over the country), and this is more important for us than the absolute numbers in themselves. Thus, when further on absolute numbers are mentioned, they can only be taken into account with the above reservations.

The first outstanding fact is that during the period concerned the pig stock never reached the pre-war level, although in certain years (1921, 1935, 1938) came very close to it. This was the case in spite of the fact that within the whole livestock the pig stock was best provided for due to the special conditions of pig breeding (independence from pastures). The total stock, about 2·6 million on the average of the whole period, was roughly the same in the twenties and thirties (2·59 million both between 1920 and 1929, and 1930 and 1938). This balance is, however, illusory, although it undoubtedly shows that pig breeding did not, in fact, make any quantitative progress in the whole period. Still, we have to point out that these data reflecting immobility show the final results of considerable fluctuations and must not divert our attention from the fluctuations themselves.

Table 38. Changes in the pig stock between 1920 and 1938 (in thousands)(1)

Year	Total stock	Lard-type		Meat-type		Young pig					
						Boar		Sow		Barrow	
		number	%	number	%	number	%	number	%	number	%
1920	2 873·0	—	—	—	—	—	—	—	—	—	—
1921	3 226·0	—	—	—	—	—	—	—	—	—	—
1922	2 743·0	—	—	—	—	—	—	—	—	—	—
1923	2 133·0	—	—	—	—	—	—	—	—	—	—
1924	2 457·9	2 315·0	94·2	142·9	5·8	268·2	10·9	927·6	33·7	557·9	22·7
1925	2 633·1	2 482·2	94·3	150·9	5·7	269·5	10·2	845·8	32·1	640·8	24·4
1926	2 519·7	2 353·6	93·4	166·1	6·6	248·3	9·9	774·1	30·7	663·0	26·3
1927	2 386·6	2 169·1	90·9	217·6	9·1	216·0	9·1	728·9	30·5	645·6	27·1
1928	2 661·5	2 402·5	90·3	259·1	9·7	255·7	9·6	826·4	31·0	732·1	27·5
1929	2 582·2	2 333·6	90·4	248·7	9·6	212·6	8·2	779·0	30·2	732·1	28·4
1930	2 361·6	2 063·0	87·4	298·6	12·7	192·2	8·1	687·5	29·1	697·4	29·5
1931	2 714·6	2 311·7	85·2	202·9	14·9	236·0	8·7	802·1	29·5	828·8	30·5
1932	2 361·2	1 938·4	82·1	422·8	17·9	293·1	8·2	694·5	23·4	700·5	29·7
1933	1 899·5	1 587·5	83·6	312·0	16·4	145·5	7·7	532·3	28·0	575·4	30·3
1934	2 502·2	2 058·9	82·3	443·3	17·2	412·0	8·5	734·2	29·3	745·5	29·8
1935	3 175·8	2 535·7	79·8	640·1	20·2	278·7	8·8	968·3	30·5	924·3	29·1
1936	2 554·3	2 107·3	82·5	447·0	17·5	192·6	7·5	762·0	29·8	748·6	29·3
1937	2 623·5	2 165·9	82·6	457·6	17·5	238·4	9·1	806·0	30·7	785·3	29·9
1938	3 110·1	2 519·3	81·0	580·8	19·0	269·1	8·7	967·8	31·1	959·8	30·9

The stock ranged between the two extreme values of 1·9 and 3·2 million, respectively, the fluctuation was thus as much as 68–69 per cent. Some role was probably played in this by the fact that the boom caused by the inflation ceased within a few years after the war, and the relatively low prices brought about a decrease in the number of the pig stock. This may have been the reason why the average number of pigs was the highest in the first half of the twenties (between 1920 and 1924). This trend was just the opposite to that of the general economic cycles which clearly indicates that the trend of pig breeding was not only determined by the general marketing conditions. Between 1925 and 1929 the average number of pigs was 2·55 million, while between 1930 and 1934 it was 2·35 million, so the decreasing tendency is beyond question.

We can speak of cycles, of zenith and nadir recurring every four or five years in pig breeding too, but they do not always correspond to the general production cycles. So e.g. 1925–1928 undoubtedly represented a peak in the twenties, then 1931 again, after which the stock rapidly decreased to touch bottom in 1933; in 1935 it culminated and after a slight decline, again in 1938. In the twenties the peaks were not high, they meant about 2·6 million pigs, but in the thirties the zenith was about 3·1 million both in 1935 and 1938. Further, it must be taken into account that the trend of pig breeding in Hungary was determined *not only* by the economic conditions. The fodder yields and epizootic diseases had a much greater influence on pig breeding than on other animal species. It is particularly the effect of fodder yields that manifests itself quite differently in pig farming

on the basis of spring registrations of useful animals

Total		Fully grown pig							
		Boar		Sow		Barrow		Total	
number	%	number	%	number	%	number	%	number	%
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1 753·7	67·3	37·7	1·5	552·2	22·5	214·3	8·7	804·2	32·7
1 756·1	66·7	41·9	1·6	602·4	22·9	232·7	8·8	877·0	33·3
1 685·4	66·9	40·5	1·6	547·3	21·7	246·5	9·8	824·3	33·1
1 590·5	66·7	37·1	1·6	530·7	22·2	228·3	9·6	796·1	33·4
1 414·2	68·1	38·0	1·4	579·2	21·8	230·1	8·6	847·3	31·8
1 723·7	66·8	35·6	1·4	554·4	21·5	268·5	10·4	858·5	33·3
1 577·1	66·7	32·0	1·4	496·8	21·0	255·7	10·8	784·5	33·2
1 866·9	68·7	38·6	1·4	571·8	21·1	237·3	8·7	847·7	31·2
1 588·1	67·3	36·4	1·5	518·8	22·0	217·9	9·2	773·1	32·7
1 253·2	66·0	27·1	1·4	413·8	21·8	205·4	10·8	646·3	34·0
1 693·7	67·6	35·1	1·4	543·3	21·7	230·1	9·2	808·5	32·3
2 171·3	68·4	40·0	1·3	679·7	21·4	284·8	9·0	1 004·5	31·7
1 703·2	66·6	33·4	1·3	530·0	20·8	287·7	11·3	851·1	33·4
1 829·7	69·7	34·2	1·3	511·8	19·5	247·8	9·8	793·8	30·2
2 196·7	70·7	35·5	1·1	612·3	19·7	265·6	8·5	913·4	29·3

compared to cattle farming or any other livestock branch. This can be explained by the higher fertility of pigs compared to other animals, which with high fodder yields leads to a considerable increase in the number of pigs in a relatively short time, while low fodder yields enable the producers not only to check the increase but even to reduce their stocks, as it is rather easy to replace them at the time of a good fodder crop. That the natural conditions played a much more important role here than in the case of other animal species is suggested by the following circumstances.

The relatively high – over 2·8 million – average number of pigs in the second half of the thirties (there were two peak years between 1935 and 1938!) was not exclusively due to the improved economic conditions and increased exports to Germany, but to the fact that in three successive years (1936–1938) record fodder yields were attained due to favourable weather conditions, and the resulting low feed prices increased the profitability of pig rearing. At the same time, it was not only the economic crisis which was responsible for the decrease in the number of pigs after 1931, since the fall in feed prices was a factor of the crisis, shifting the trend of development toward livestock husbandry, mainly pig raising (1931 is considered to have been a peak year). It was to a great extent the consequence of swine-fever causing enormous losses in 1931–1932 and reducing the pig stock catastrophically.

Then in the second half of the thirties, when the control of swine-fever was already much more efficient, the development of the pig stock was enhanced not

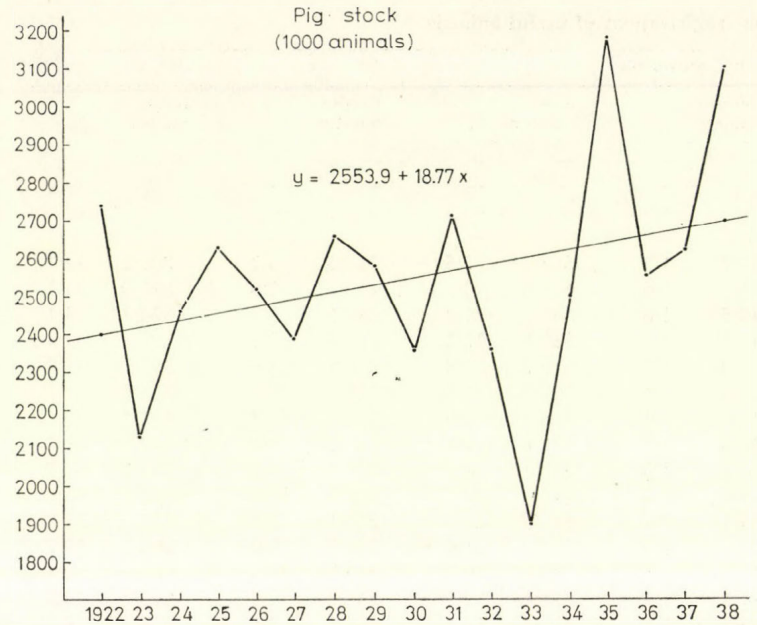


Fig. 27. Trend of the pig stock, 1922–1938

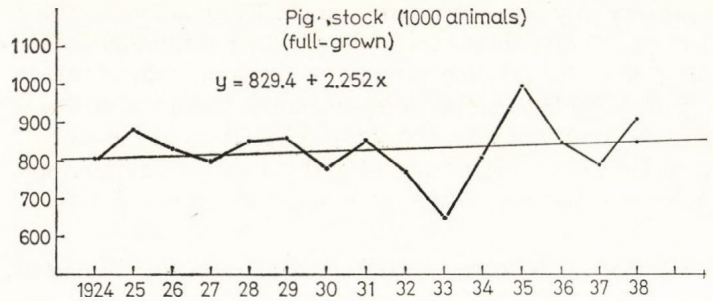


Fig. 28. Trend of the full-grown pig stock, 1922–1938

only by the favourable economic situation and good fodder crops but also by the wide application of preventive measures for controlling swine-fever. However, all these fluctuations took place essentially within the same limits, the number of pigs did not substantially change until 1938. We cannot give an account of any considerable change that proved permanent, as it was prevented by the fact that pig breeding was kept in check by considerable difficulties in marketing. Pig maintenance and fattering were carried on at a relative loss almost throughout the whole period except the second half of the thirties, when the stock showed a slight increase, and even the foundations of a more substantial increase were ... down.

We arrive at the same conclusion when studying the structure of the pig stock. The general phenomenon that any fluctuation in the livestock is felt first of all in the number of young animals is even more peculiar in the case of pigs. Whenever the total stock decreases in number the proportion of full-grown animals usually becomes more or less larger, moreover, there were cases when parallel to a decrease in the total stock the full-grown pigs increased in absolute numbers too (e.g. in 1929). There are precedents, on the other hand, for the full-grown stock having decreased in absolute numbers while the total stock increased (e.g. in 1937). However, the bulk of the growth fell to the young animals in each case. And since between 1920 and 1938 the pig stock ranged, in fact, within given limits, the ratio of full-grown to young animals did not essentially change. It was only in the last years of the period that a slight shift occurred in favour of the young stock, when under the influence of a better economic situation and other factors the whole stock grew. It was due to this that the proportion of full-grown pigs – which generally was about 33 per cent and only decreased to 31·2 per cent in 1931 – in one of the peak years – fell to 29·3 per cent in 1938. This was not, however, either a final result or any essential change, although in the last two years of the period concerned the stock of young pigs undoubtedlywas greatly increased by the constant growth of the total stock. So the foundations were laid for a large-scale development which took place then during the first years of the Second World War.

The proportion of sows mostly ran parallel with the changes in the total full-grown stock. This proportion was rather consistently 21·1–22·9 per cent, and only in the second half of the thirties began to decrease both in percentage (to 19·5 per cent) and in absolute numbers, at a time when the total stock was increasing (in 1937). The barrows, on the other hand, showed the opposite trend; their number, and accordingly their proportion too – which usually was 8·6–9·8 per cent – increased in the very mid-thirties (1934–35) to 9·4–11·3 per cent. With this it reached top, a number of about 280 000. Development stopped here, moreover – in accordance with the economic situation – the number of barrows fell back. A decline is shown – as in other animal species too – in the proportion and number of full-grown boars too. Up to the middle of the twenties their proportion usually was 1·5–1·6 per cent; in 1928 it fell to 1·4 per cent then stopped. From 1935, however, this proportion continued to decrease, to 1·3 then in 1938 to 1·1 per cent, which – naturally – must have reflected the qualitative improvement of boars for service too.

The stock of young boars displayed roughly the same progress, its proportion decreased likewise, from the higher than 10 per cent level of the mid-twenties to about 8 per cent. It is all the more remarkable that the reduction in the number of sows within the stock of young pigs was a quite predominant feature throughout the whole period, or at least until 1935. The proportion of young sows gradually decreased from 33·7 per cent (it had never been higher than that) to 29·3 per cent by 1934, and a similar decrease occurred in the absolute number of young sows too, which fell from 927 to 700 thousand. The decline was only stopped – and the stock increased again, respectively, – by the favourable economic situation in the

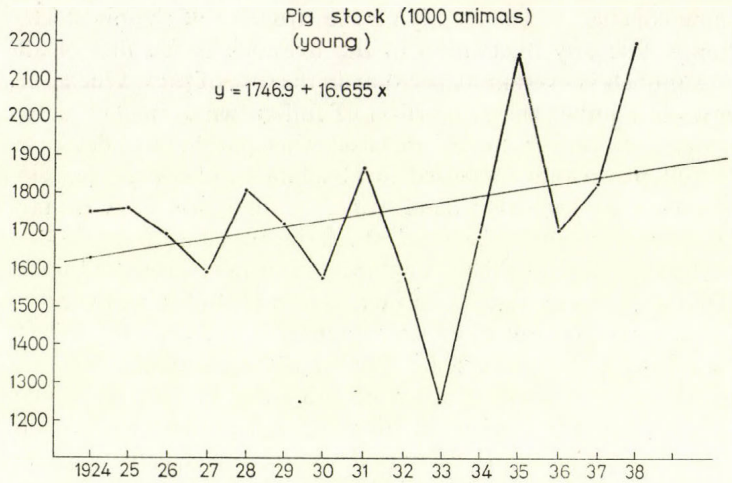


Fig. 29. Trend of the young pig stock, 1922–1938

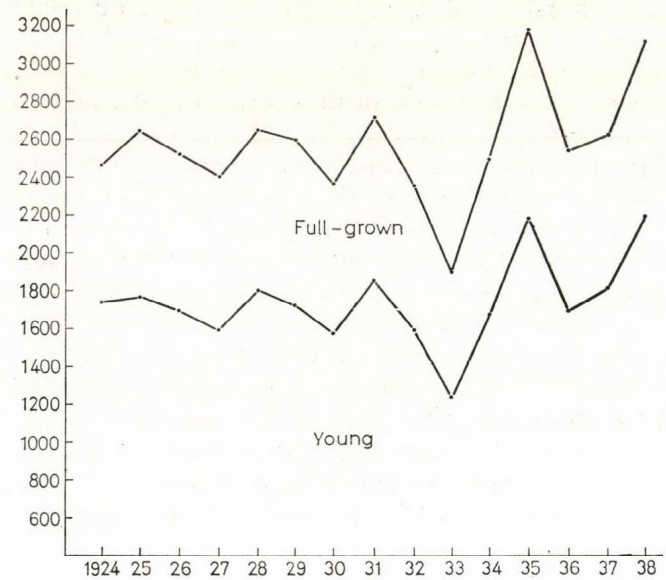


Fig. 30. Structure of the pig stock, 1922–1938

second half of the thirties. In 1938 its proportion rose again to above 31 per cent, clearly indicating an increased zeal for breeding. This decrease in the number of sows within the pig stock, and in accordance with it a considerable increase in the proportion of barrows (from 22·7 to 30·9 per cent) indicated that the growth of the stock – except the last years – was unprofitable. The decrease of the proportion of young boars was roughly parallel with that of full-grown boars, and even

the reasons must have been the same. We cannot say thus that the inner ratios of the stock essentially changed during the period between 1920 and 1938. The composition of the stock suggests that – with the exception of the second half of the thirties – not much effort was made to increase the pig stock. As the first step in pig breeding, the number and proportion of young animals should have been raised. This only began in the second half of the thirties.

With regard to the composition of breed, the prospects were much brighter, for, in every respect, the increasing predominance of meat-type breeds over lard-type ones indicated a tendency of the improvement of the quality. In the statistics of those years even the meat-type pig in the modern sense of the word can be found here and there; during the First World War these breeds – not belonging to the lard-type but ranked with the meat-type pigs – were not encountered on the present area of Hungary. In the twenties and thirties the statistical surveys were thus more realistic already in this regard, though it must be taken into account that part of the pig breeds called meat-type in Hungary, in Western Europe are placed among the lard-type pigs. That is why at the beginning of the twenties the proportion of meat-type pigs was lower than before the First World War when the old breeds too had been ranked with the meat-type pigs. The improvement was gradual after 1927, between 1924 and 1926 (there are no reliable data available from the period preceding 1924) the proportion of meat-type pigs ranged from 5·7 to 6·6 per cent. The first essential change occurred in 1927 when this proportion rose to and stopped at 9·1 per cent. After the next three years, under the impact of the crisis, there was a gradual increase; the proportion of meat-type pigs grew to 12·7 in 1930, 14·9 in 1931 and 17·9 per cent in 1932. After this it was about 17 per cent for years (though in 1935 it exceeded 20 per cent), and finally stopped at 19 per cent in 1938. This relatively rapid development (the proportion of meat-type pigs grew almost fourfold in 16 years!) can be explained by the effects of the crisis. The latter caused serious difficulties in selling the lard, increasing at the same time the demand for meat-type pigs which was anyway strong throughout the whole period. The gradual increase of exports to Germany, the extension of bacon production, orientated the course of development in this direction, and the results are not to be dismissed lightly.

The regional distribution of the pig stock is less uniform than that of other animal species which suggests again that pig breeding is highly responsive to various factors.

If we only consider the final results it will undoubtedly become clear that the dominance of Transdanubia in pig breeding slightly grew. The relatively high initial proportion of Transdanubia (48·86 per cent) increased to 49·82 per cent by 1938, that is, nearly half of the pig stock was found in Transdanubia (Table 39).

The other conclusion is that even if the percentage proportion of the pig stock was not unchanged on the northern areas, its abolute number ranged, essentially, within narrow limits. This part of the country did not excel in having a large pig stock. The other major area of pig breeding was the Great Hungarian Plain, though its share of pig breeding slightly declined.

Table 39. Regional distribution of the pig stock (1000 animals) between 1924 and 1938(2)

Region	1924	1925	1928	1931	1934	1938
Transdanubia	1199	1237	1167	1316	1206	1548
Great Hungarian Plain	1036	1161	1245	1151	1076	1296
Northern Hungary	219	235	249	248	237	263
Hungary total	2454	2633	2661	2715	2519	3107

We cannot, of course, stop here in our investigations, since a closer analysis reveals considerable differences. It is thus remarkable that in the twenties the pig stock of Transdanubia only increased to a relatively low extent, or – compared with an overall growth in the country – even decreased in number. Between 1924 and 1928, simultaneously with an increase in the total stock of Hungary, the pig stock in Transdanubia dropped both in number and proportion suggesting that in Transdanubia pig breeding was more responsive to any change in the economic conditions. The situation changed in the thirties when – as a consequence of a revived inclination for breeding – the stock grew all over Transdanubia, and it was the Great Hungarian Plain instead where pig breeding declined. Between 1928 and 1931 e.g. the total pig stock grew from 2·66 to 2·7 million, but the growth was only apparent in Transdanubia (146 thousand), while in the Great Plain and in the North the joint reduction was 95 thousand pigs. And later, when the stock increased on these areas, even that did not happen at the same rate as in Transdanubia. In the thirties the conditions of pig breeding were more favourable in the western part of the country, indicated by the low milk prices of the dairy districts whereby pig breeding – particularly of meat-type breeds – was more profitable.

But a further step has to be taken to examine the development trends in detail. Namely, the changes in the pig stock show tremendous diversity even within a region. For example, in Fejér county between 1924 and 1938 the pig stock increased by nearly 90, and in Bihar County by almost 80 per cent. In Csanád County the number of pigs decidedly decreased while in the Great Plain it generally grew by 25 per cent compared to the 1924 level. It is quite remarkable that, while pig farming in Transdanubia was undoubtedly concentrated in those counties where cattle farming too had its centres since exactly 74 per cent of the pig stock was found in the vast semicircle extending from Vas County to Fejér County (and this did not even change by 1938), still, if we disregard the outstanding increase of stock in Fejér County, we find an equalizing tendency in Transdanubia. At the same time the overwhelming dominance of Somogy County over all other parts of the country was beyond question (in 1924 more than 11, in 1938 almost 10 per cent of the stock was found here).

We find the same process to have taken place in the northern areas, and even in the Great Hungarian Plain (although sometimes a decline within the general growth between 1924 and 1938 must be reckoned with here too, as e.g. in Csongrád County), which suggests that the bulk of growth fell to those areas where the den-

sity of the pig stock had not attained the general level. Thus the growth of the pig stock manifested itself in a better distribution unlike the cattle stock which in the leading cattle breeding regions continued to grow primarily. So pig breeding to some extent compensated these areas for having fallen behind in cattle breeding.

As referred to above, one of the most characteristic features in the qualitative development of the pig stock was the increasing predominance of various meat-type breeds. This had considerable advantages from many aspects. Beyond the fact that "mangalica" pigs could no longer satisfy the foreign – and before long even the domestic – requirements, the meat-type breeds generally were more fertile, so when spread they improved not only the quality but also the quantity of the stock. A more extensive introduction of various meat-type breeds only began after the First World War(3), earlier they had been only bred in some larger pig-breeding farms. The meat-type pig stock of the 1911 animal census mostly was not of western origin, but an ancient Hungarian breed managed under highly extensive conditions, and its reproduction was not profitable. The extensive introduction of western – English and Scandinavian (partly Danish) – meat-type pigs only took place after 1919. Development had two characteristic features. First, the meat-type pigs, or the Western European lard-type pigs producing less fat and more meat compared to the mangalica pig, spread not only in the larger pig-farms but among the peasants and smaller breeders too, especially in Transdanubia. This at the same time was an indication that the peasant production was coming closer to the market, since peasants usually reared mangalica pigs for household consumption. The other clear symptom of development was the appearance of black meat-type pigs(4) beside the white ones – especially in the thirties –, which in itself meant a step ahead.

No doubt, however, that under Hungarian conditions, in the twenties and thirties in general, and especially in farms not primarily producing for the market the mangalica breed was raised with considerable economic advantages. The mangalica breed was particularly economical in the Great Hungarian Plain where dairy farming was less common than in Transdanubia, because it could be fed by grazing and generally was less demanding than the different breeds of western pigs. Management and feeding did not require as much care and attention as the meat-type pigs, and the quality of feed was also different. For this very reason it was not surprising that under the given extensive conditions – primarily among the poor peasants – the meat-type pigs could not become wide-spread. This was especially so when, during the economic crisis, maintaining of meat-type pigs was not profitable anywhere in the country, but least of all in the Great Plain(5). However, crossing became all the more important and the crossing of meat-type and mangalica pigs assumed considerable proportions, and this – though without any decisive influence on the character of breed – greatly improved the mangalica stock, increased its meat production and – not in the least – improved its fertility. The qualitative improvement of the mangalica stock was not to be neglected anyway, as more than 80 per cent of the stock consisted of mangalica pigs even when the introduction of meat-type pigs had already grown to considerable

dimensions. For the renewal of the stock an exchange of boars was organized which resulted in a certain regeneration of the mangalica breed.

There was some progress too in the organization of pig breeding, not only from a social aspect by the establishment of breeders' associations (National Association of Meat-Type Pig Breeders in 1923, National Association of Mangalica Breeders in 1927), but also by the improvement of registration. The demand for a first-class breeding stock required the general introduction of herd-book registration. Such breeding stocks were developed even in peasant farms, still we cannot say that the registration of pigs brought about any substantial progress among the peasantry. The small farms, especially the urban and rural farms fattening for their own consumption, as well as the poorer peasant categories in general showed hardly any indication of their animals having been registered, which, after all, is easy to understand. From these swine-growers no kind of breeding intention could be expected either.

It is similarly difficult to decide whether the further characteristics of the improved breeding and management conditions – such as a better feed utilization, improved management, feeding and fattening methods by which the development period of animals was considerably reduced with the application of protein rich feeds – affected at all the peasant pig management and if so, to what extent, and in what form. The introduction of express fattening did not perceptively affect larger masses of pig breeders and growers, it was realized – and the profit skimmed – by the larger fattening farms and industrial fattening plants. The differences were increased by the fact that fattening assumed a marked *industrial* character, first of all on the largest estates and in the fattening plants organized within their frames. Thus the results of science reached the pig stocks and fattening plants of only large farms, and even there were not always applied with efficiency in the thirties; the wider application of scientific methods, in peasant production too, remained a task of the future. The demands of domestic meat industry and export were fully satisfied by the large stocks, but the difficulties of marketing which, naturally, caused more trouble to the small farms, prevented the wider application of more advanced methods. In accordance with all this the difference between up-to-date large-scale pig-farms and those managed within the traditional frames, under management conditions becoming more and more primitive, grew immensely. It was especially in the years of the crisis that the gap between the extensive methods of peasant pig raising and the modern techniques of rationalized large-scale pig-farms grew wider(6).

For the development of pig breeding the quantitative and qualitative improvement of the breeding stock is very important, so it is worth while having a closer look at this problem.

The number of boars for service did not change much during the period concerned, the fluctuation was not too great but undoubtedly resulted in an increased number of sows per boar, as in the second half of the thirties the total stock, and within it the number of sows increased. In 1935, 51 sows and in 1938, 48 fell to each boar for service in common breeding, which was a very bad ratio, since

according to the contemporary literature even in the case of mating from hand (which in pig breeding was not widely used at all) one boar should only serve 30–40 sows. So the supply in boars for service did not improve, moreover, the situation became worse in the thirties (in 1930 the ratio of boars to sows was 1 : 43).

However, compared to the animal species discussed so far an essential difference is shown by the distribution of boars for service among the common and private stocks. The number of boars for service in the private stocks undoubtedly decreased during the period. Its proportion within the total stock of boars for service fell accordingly from 69·4 to 63·6 per cent. Even so the importance of privately owned service boars was very great: roughly two-thirds of the total number of service boars was owned throughout the period by private breeders. The situation was thus just the opposite of that in cattle breeding, but this had a more serious effect on the whole stock than in the case of cattle breeding. Namely – as we shall see – an overwhelming part of sows was owned by breeders who did not have boars. In fact, two-thirds of the service boars were concentrated in large pig-farms, which resulted in a boar/sow ratio of 1 : 11–13 in private stocks on a national scale. This was a highly favourable ratio, and its effect was apparent in private stocks. That is why the slight decrease in the number of privately owned service boars was not disadvantageous in any respect. An increase in the number of service boars used in common would have been all the more important, since the slight qualitative improvement between 1924 and 1938 could not keep abreast with the growth of the sow stock. This situation is not disclosed by the percentage composition, since while the number of privately owned boars decreased, that of the boars used is common increased, so the proportion of service boars used in common rose from 30·6 per cent to above 36 per cent(7). For this very reason the unfavourable situation of common breeding is much better demonstrated with the number of sows per boar, and its trend – as seen before – was not comforting at all.

The situation, which was unfavourable anyway, was made even worse by the fact that the proportion of meat-type boars used in common breeding was still lower. Although between 1924 and 1938 the number of meat-type boars grew exactly threefold, and in common breeding to an even higher extent, still the position of common breeding was less favourable in this respect. In 1938 the proportion of boars used in common was but slightly over 30 per cent, that is, it did not reach the average level. Earlier the conditions were even worse. Until 1930 the ratio of boars used in common was below 20 per cent, which clearly shows that meat-type pigs were first introduced in the larger pig-farms, and began to spread only later, in the thirties, resulting in an increased number and ratio of meat-type boars in common breeding too. But this progress was slow even in the second half of the thirties. The situation was better with the mangalica breed, where a higher than average ratio of boars for service were used in common breeding indicating that in small farms mangalica was the predominant breed.

Breeders not having boars of their own, owned 65–69 per cent of the sows,

while the percentage of boars used in common breeding hardly reached half of this proportion. True, the statistical data show a slight improvement of the situation inasmuch as the number of sows owned by breeders having service boars of their own somewhat increased, from 31–32 per cent in the twenties to 34 per cent by the second half of the thirties(8). However, this increase hardly affected the bulk of the peasant pig population, and meant the concentration of the pig stock in the larger farms rather than a wider distribution of boars for service in the peasant stocks. The favourable position of larger farms is accentuated also by the fact that after the great losses caused by the swine-fever in 1931–32 – as seen from the number of privately owned sows – they recovered in a shorter time than peasant farms.

We give an interesting picture of the structure of breeding when studying the proportions of sows and boars in the different regions and counties of Hungary (Table 40).

According to the final results the ratio of boar to sow was 1 : 48 in common breeding and 1 : 14 in private stocks on a national average. The latter is not worth discussing since it is obvious that in farms having boars of their own the adequate ratio developed from the beginning. And the 1 : 16 ratio of boar to sow in Transdanubia compared to 1 : 12 in the Great Hungarian Plain and in the North alike shows a better utilization of boars under more up-to-date feeding and management conditions in larger Transdanubian pig-farms rather. It is, naturally, in connection with the different settlement patterns too; the detached farmstead system in the Great Plain, the great distance of farms from one another made the self-sufficiency of farms in boar for service necessary, while in Transdanubia this was superfluous. The above data can, however, be used for revealing the conditions of utilization. Accordingly, in Transdanubia the highest number of sows per boar was 29; 25–30 can be regarded here as a relatively favourable upper limit of boar utilization, if we consider that mating from hand could be more easily realized in private farms, though this number is naturally but an extreme value. On a national scale the situation was quite favourable both on the northern areas and in the lowland counties, in the Great Plain only certain larger towns, as e.g. Hódmezővásárhely and Debrecen, as well as the counties of Hajdú and Szolnok showed extremely unfavourable boar/sow ratios in the private pig-farms too (58–92 sows per boar). In the mentioned two counties the ratio (1 : 71 and 1 : 92, respectively)

Table 40. Number of sows per boar in the different regions of Hungary in 1938(9)

Region	Total stock		Mangalica		Meat-type	
	common breeding	private	common	private	common	private
Transdanubia	45	16	42	17	54	14
Great Hungarian Plain	54	12	50	11	229	12
Northern Hungary	43	12	40	11	212	18
Hungary total	48	14	45	13	73	14

was much worse than in common breeding (while in Debrecen not a single boar was found in common breeding!).

The national average of sows per boar in common breeding (1 : 48) does not, in fact, mean too great deviations. In the Great Plain 54, in Transdanubia 45 and on the northern areas 43 sows fell to each boar. This only accentuates the relatively unfavourable position of the Great Plain in a generally unfavourable situation. Namely, the supply in boar did not meet the requirements of the pig population, which meant a serious problem. It was a considerable obstacle to qualitative improvement primarily in common breeding.

Another bad circumstance which influenced the quality of the pig stock was that meat-type breeds were already widely introduced in the country while the supply of boars for common breeding had not yet been sufficiently organized. This had, of course, exclusively financial causes, since the villages, legal authorities did not have the necessary financial means to provide pig breeding with the sufficient number of meat-type boars. This upset the balance of breeding. The small peasant breeders purchased sows from the western pig breeds and relied on the assistance of the government in the purchase of boars. They believed that the expenses of boar supply in meat-type pig breeding – like in all other livestock branches – would be covered by the state. However, the economic world crisis upset these calculations. The government stopped purchasing boars for service, and this fixed the differences between the regions of the country in this field too. Namely, the different regions of Hungary were not at the same level of development in pig breeding. In Transdanubia where meat-type breeds had been introduced earlier, their breeding was in a more advanced state in 1938, and even the boar supply was better. The more favourable position of Transdanubia was indicated by the fact that an overwhelming part of the total meat-type stock of Hungary – two-thirds of sows and more than 61 per cent of boars – was concentrated there, and this region of the country was already on the way to a normal boar supply of the meat-type pig population. This is the explanation for the surprising situation that while in Transdanubia 54 sows fell to each meat-type boar (of western breed) used in common breeding, the number of sows per boar was 212 on the northern areas and 229 in the Great Hungarian Plain, which shows the enormous difference between the number of sows and that of boars in the latter two regions at that time, and suggests that the western sows were served here by "mangalica" boars. But even in Transdanubia the development level was not uniform, some areas were rather backward, e.g. the counties of Fejér and Esztergom – Komárom. Besides, we have to pay attention to the fact that meat-type pig breeding was not exclusively concentrated to the South-Transdanubian counties, the northern and western counties had a considerable share in it as well. Especially county Sopron and Vas played an important role in this field, though, naturally, meat-type pig breeding was dominant in the semi-circle extending from Vas to Baranya.

The rapid development of countries Sopron and Vas in the field of meat-type pig breeding can be accounted for by the fact that after 1918 these counties lost the nearby markets of Vienna and Prague, and it was more profitable for the

large-scale dairy-farms to sell the milk to the local pig-farms than to transport it to Budapest. In other parts of the country meat-type pig breeding was only at various stages of the first phase. In the thirties in many villages of these areas meat-type sows were here and there kept in such farms too, where meat-type boars were not available. So in the counties of Abaúj, Zemplén, Bihar, Csongrád, Hajdú, and in the town of Debrecen meat-type boars were not found at all in common breeding, although meat-type sows were reared on these areas too – even if their number was not too high. But even in other counties where meat-type boars (of western breeds) were sparsely introduced in common breeding too, only the first steps were taken, since e.g. in Borsod–Gömör County 366, in Csanád 946 (!), in Jász – Nagykun – Szolnok 602, and in Szabolcs County 691 sows fell to each meat-type boar. On these areas common breeding is not worth discussing, as it is obvious that with two to five, or occasionally eight boars in an entire county, normal breeding cannot be carried on. And with the exception of Transdanubia this was the case on the whole area of Hungary. Nevertheless, the first step – introduction of sows – was taken here too. Pure-blood populations of meat-type pigs could not be developed yet, only the mangalica breed could be improved, at the most. Table 40 reveals great differences: in Transdanubia meat-type pig raising was already at a higher stage of development than in other parts of the country. (Namely, due to peculiarities of the settlement system those breeders of the Great Hungarian Plain who did not have boars for service probably could not safely rely on pig farms where meat-type boars were available.)

The situation was much more balanced in mangalica breeding. As to the quality of breeding, the superiority of Transdanubia over the Great Plain was beyond question. Although within the whole mangalica population nearly 50 per cent of the total number of sows was found in the Great Plain, still the centre of breeding was in Transdanubia. In the counties of Szabolcs and Bihar the supply of boars was as satisfactory as either in Transdanubia or on the northern areas, but the other parts of the Great Plain fell far behind the latter. The supply was relatively uniform on the hilly northern areas, and this balance indicated that (considering the slight fluctuation in the pig population as well) under the given regional and farm conditions a definite pattern of pig breeding had taken shape on the northern areas. In any case, even if considering the mangalica population alone we cannot deny that the boar supply was not satisfactory. In addition, the method of mating from hand spread at a relatively slow rate, and even in dimensions did not reach the cattle or horse breeding average, thus the deficiency of males was a greater problem in pig breeding than in any other livestock branch.

Another reason for the relative backwardness of pig breeding was given by the tremendous losses caused by diseases. Even the officially reported loss was enormous never being less than 44 thousand animals a year. In 1920–21, on the other hand, 108 and 116 thousand, respectively, in 1925, 100 thousand, in 1926, 89 thousand, in 1931–32, 206 and 250 thousand, in 1934, 180 thousand and in 1935, 150 thousand animals perished of epizootic diseases. And we strongly suspect that the actual losses – especially those caused by swine-fever – were much greater

than recorded, although the recorded loss, even in "normal" years, attained or exceeded 2 per cent of the pig population, while in more severe years reached 5 or even 10 per cent(10)! Thus the control of swine-fever did not attain any perceptible result between 1920 and 1938. True, as a consequence of simultaneous inoculations widely applied in the second half of the thirties (up to 1938 about 1 million voluntary simultaneous inoculations) the prospects of swine-fever control improved, but no substantial result was shown until 1938. Looking at the numerical data we can see hardly any progress in this field. Still, we must appreciate the achievements of that period as the results manifested themselves in the subsequent years.

The marketing crisis setting in after 1929 was a great hindrance to pig breeding as well. Pig farming was of outstanding importance for the whole economy of Hungary, as it provided a substantial part of the income originating from meat production. Pig farming was highly important for the peasantry too: in 1935 69·3 per cent of the total pig population was found on farms smaller than 60 ha(11).

The crisis caused an enormous fall in prices, and since the prices attained abroad were higher than the domestic prices a keen competition began for the export. Until the second half of the thirties Czechoslovakia and Austria, and from 1936 Germany were the main export outlets. So a fierce competition developed for the Czechoslovakian and Austrian markets. In 1934 exports to both countries were monopolized by the government(12). The quotas were distributed among farms, fattening plants and co-operatives so as to exclude the trade. The "farms", naturally, meant in the first place the large estates; in 1936 e.g. 69·2 per cent of the exports to Austria was provided by farms larger than 120 ha, 23·1 per cent by the industrial fattening plants, and only 7·7 per cent of the exports fell to the share of farms below 120 ha(13). In the course of the years, however, under the pressure of the peasantry their participation – though primarily that of wealthy peasants – in the export slightly increased (purchasing organs took over 8–10 pigs at a time). The "Hangya" Co-operative, on the other hand, whose share in the export gradually increased, and whose duty would have been to represent the peasant producers partly with a view to quality, partly for other reasons, often exported the animals of large estate owners instead of those of small peasants.

In August 1938 the whole export of pigs was taken over by the Hungarian Export Co-operative of Animals and Animal Products. From then on the export possibilities of the peasantry undoubtedly grew, though not in the desired measure. The interests of large producers continued to dominate in this field(14).

The situation was similar in the sphere of lard and bacon exports with the difference that large estates were not interested here, only the trade. Markets were monopolized in 1934, partly at the request of Germany (the fascist German state apparatus monopolized the imports and insisted on monopolization in Hungary too), partly under pressure of the trade(15). In the monopoly (Hungarian Lard- and Bacon Selling Bureau) only those organizations had a share which had exported lard and bacon by occupation for five years preceding 1935–36. These measures served primarily the interests of larger exporters. Thus, the government

policy was not always directed against trade, only when whole-sale trade entered the competition, and in the lard and bacon exports there was no such danger ahead. In 1938 the role of this Bureau too was taken over by the Hungarian Export Co-operation of Animals and Animal Products.

The unfavourable trend of pig prices hard hit the whole production, so the government attempted to maintain the prices by supporting the market. This solution, though first affecting the large producers, was not disadvantageous for the peasantry either, as it stabilized the prices. By 1935 the system of subsidized prices ended in failure, and prices continued to fall(16). Then a new method was tried: consignments to Budapest were restricted, or more precisely, only permitted to "farmers"(17). These arrangements were undoubtedly favourable for large estate owners who were allowed to lead, as "farmers", their animals to market, and who, indeed, were able to do so having even earlier delivered considerable volumes of pig to Budapest. But for the peasantry this resulted in an adverse situation, since small peasant farmers had usually sold 1–2 or occasionally more pigs to the dealers on the spot, and got as far as the next market at the most, and almost never reached the big market of Budapest. When the new system prevented them from sending their products through the dealers to Budapest, the supply increased in the country (except Budapest), and the fall in price became more intensive.

These arrangements – more than anything – show the true nature of the "protection of farmers". By excluding the trade, the government struck, in fact, at the small peasants to the advantage of large farmers, and especially of large estate owners.

Notes

(1) On the basis of spring registration data on useful animals, annual OMK reports, National Archives: Preparation of peace, and statistical papers of spring registrations of useful animals. (O. L. F. M.) See further: Konkoly-Thege: op. cit. 169.
(2) On the basis of spring registration data on useful animals. See further: National Archives: Preparation of peace.
(3) Éber: op. cit. 466, annual OMK reports.
(4) Konkoly-Thege: op. cit. 250.
(5) OMK, 1937, 86.
(6) Éber: op. cit. 465–468.
(7) On the basis of spring registration data on useful animals. Annual OMK reports.
(8) On the basis of spring registration data on useful animals. Annual OMK reports.
(9) On the basis of spring registration data on useful animals. See: National Archives: Preparation of peace.
(10) On the basis of data of the Hungarian Statistical Year-Books. See further: Konkoly-Thege: op. cit. 174.
(11) For the income originating from pig farming see: Éber: op. cit. 424. Cf.: Matolcsy–Varga: op. cit. For the distribution of the pig population in 1935 see: Magyarország mezőgazdaságának főbb üzemi adatai az 1935. évben a gazdaságok (üzemek) nagyság szerint (Major operative data of Hungarian agriculture in 1935, according to the size of farms). Magyar Statisztikai Közlöny. New series. Vol. 112. Budapest, 1941.

(12) Szuhay: op. cit. 217 and 224.
(13) Idem. 217.
(14) Idem. 220 and sqq.
(15) Idem. 224–226.
(16) Idem. 222 and annual OMK reports 1935 and 1936. See further: Éber: op. cit. 464–465. Incze: op. cit. 240.
(17) Szuhay: op. cit. 222–223. Annual OMK report 1936. 156.

Chapter 12 Sheep farming

Sheep is the other animal species difficult to assess statistically. Some part is played in this by the fact that lambing is protracted to the end of winter or beginning of spring which may cause many disturbing circumstances in a statistical survey. Here too a great difference is shown between facts and statistical data. The Hungarian literature – taking the data of the animal census into consideration – generally reckons with a regular deviation of 15–20 per cent; this is the percentage the current sheep stock usually is overestimated by(1).

As for the trend shown by the number of sheep the first remarkable fact is that between 1920 and 1938 the sheep stock of Hungary never reached the 1911 level. True, in 1911 a national animal census was carried out instead of the spring registration, and as revealed by the comparison of spring registration and national census in 1935(2), a deviation of about 18–19 per cent must be reckoned with in favour of the census. Even if this ratio is applied to 1911, the sheep stock was smaller by an average of at least 600–700 thousand animals after 1919. The differ-

Table 41. Sheep stock trends between 1920 and 1938 on the basis of

Year	Total stock	Short-wooled		Long-wooled		Lamb (under 1 year)			
		1000 animals	%	1000 animals	%	Male 1000 animals	%	Female 1000 animals	%
1920	1 401·0	—	—	—	—	—	—	—	—
1921	1 489·0	—	—	—	—	—	—	—	—
1922	1 352·0	—	—	—	—	—	—	—	—
1923	1 587·0	—	—	—	—	—	—	—	—
1924	1 813·2	—	—	—	—	79·9	4·4	292·5	16·2
1925	1 890·5	—	—	—	—	74·8	3·9	281·9	14·9
1926	1 804·0	—	—	—	—	75·0	4·2	273·4	15·2
1927	1 610·6	—	—	—	—	52·4	3·3	213·9	13·3
1928	1 566·2	—	—	—	—	50·4	3·2	218·7	14·0
1929	1 573·2	—	—	—	—	48·4	3·1	222·0	14·1
1930	1 463·8	—	—	—	—	45·9	3·1	184·5	12·6
1931	1 440·5	—	—	—	—	53·5	3·7	196·4	13·6
1932	1 210·5	—	—	—	—	38·3	2·3	163·1	13·5
1933	1 057·6	—	—	—	—	33·4	3·2	136·5	12·8
1934	1 087·4	1 021·0	93·5	66·5	6·1	41·6	3·8	154·1	14·2
1935	1 227·5	1 156·0	94·2	71·6	5·8	44·3	3·6	169·9	13·8
1936	1 350·4	1 269·8	94·0	80·6	6·0	44·6	3·3	193·8	14·4
1937	1 483·8	1 406·6	94·8	77·3	5·2	57·7	3·9	217·6	14·7
1938	1 628·7	1 518·6	93·2	110·1	6·8	67·4	4·1	242·0	14·9

ence is rather great which suggests that the depression felt already in the second half of the last century, and responsible for further decreases in the sheep stock, continued in sheep farming after 1918. The reason why this decrease of the stock accelerated in the twenties and thirties was that the pastures on the present area of Hungary were of very poor quality, further, owing to its dependence on the fodder import sheep farming was exposed to fluctuations in the economic conditions to a much greater extent than cattle or horse breeding; in this respect it was only comparable to pig farming. As a consequence of what has been told above – since wool prices generally were rather low – the whole sheep stock was reduced. On the average of the period the number of sheep was around 1475 thousand, that is, remained far below the pre-war level. True, it was not stagnant, but even at the peak in 1925 did not exceed 1·9 million; and if we add 20 per cent (the possible error of the survey), even so the stock was below the pre-war level by at least 200–250 thousand animals. During the First World War, especially in 1917–1918 the sheep stock showed an intensive decrease. The situation was made even worse by the serious losses suffered by the sheep stock – owned mainly by large estates – during the revolutions (Table 41).

Between 1920 and 1925 the sheep stock showed a considerable quantitative improvement. We have to note, though, that later, during the economic crisis the number of sheep was reduced to a greater extent than during and after the war, in 1933–34 it fell far below the level attained at the end of the war; still the losses during the war must have been substantial. It is thus not surprising that at the

spring registrations of useful animals(2)

Full-grown sheep (over 1 year)											
Wether 1000 animals	%	Total 1000 animals	%	Ram 1000 animals	%	Ewe 1000 animals	%	Wether 1000 animals	%	Total 1000 animals	%
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
144·1	7·9	516·5	28·5	52·5	2·9	994·7	54·8	250·6	13·8	1 297·8	71·5
141·3	7·5	498·0	26·5	54·0	2·9	1 084·3	57·4	254·2	13·4	1 392·5	73·7
131·2	7·3	479·6	26·7	50·5	2·8	1 036·8	57·4	236·9	13·1	1 324·2	73·3
123·4	7·7	389·7	24·3	43·4	2·7	963·4	59·7	214·1	13·3	1 220·9	75·7
117·6	7·8	391·2	25·0	41·8	2·7	924·6	59·0	208·6	13·3	1 175·0	75·0
117·6	7·5	388·0	24·7	42·3	2·7	919·1	58·4	223·8	14·2	1 185·2	73·3
103·4	7·1	333·8	22·8	38·5	2·7	880·0	60·1	211·3	14·4	1 129·8	77·2
111·0	7·7	360·9	25·0	39·0	2·7	855·1	59·4	185·5	12·9	1 079·6	75·0
85·7	7·1	287·1	23·1	33·3	2·8	739·5	61·1	150·6	12·3	923·4	76·2
77·0	7·3	246·9	23·3	28·1	2·7	659·9	62·4	122·7	11·6	810·7	76·7
81·4	7·5	277·1	25·5	30·4	2·8	664·2	61·1	115·7	10·7	810·3	74·5
97·4	7·9	311·6	25·3	33·6	2·7	745·4	60·8	136·9	11·2	915·9	74·7
111·8	8·3	350·2	26·0	37·6	2·8	799·9	59·2	162·7	12·0	1 000·2	74·0
114·0	7·7	389·3	26·3	37·0	2·5	883·1	59·4	174·4	11·8	1 094·5	73·7
130·3	8·0	439·7	27·0	45·4	2·8	965·1	59·2	178·5	11·0	1 189·0	73·0

beginning of the twenties a large-scale development started which culminated in 1925 when the number of sheep in Hungary amounted to 1·89 million.

The unfavourable trend of wool prices made its effect felt already after 1925. An overall boom was still going on when from 1925 the number of sheep began to fall rapidly. Owing to the fall in wool price maintenance of the stock was no longer feasible even on areas with good pastures, and the poor quality, rapidly drying pastures made the production very expensive; so the decrease of the stock assumed disquieting dimensions. Between 1929 and 1934 the rate of decrease accelerated. In 1933 the sheep stock of Hungary did not exceed 1 million; it was not even 56 per cent of the sheep number of 1925. Then, under the influence of certain price increasing measures – to be discussed later – the number of sheep began to grow while the crisis was still going on. In 1933–34 the decrease stopped, and from 1935 the stock grew again. In four years – by 1938 – it exceeded 1·6 million, giving thus a relatively quick response to the favourable trends of the economic situation. However, the level of the mid-twenties could not be attained even then; the average sheep number of the thirties was only 1·32 million compared to 1·60 in the twenties. The trend of the five-year cycles is even more characteristic. While in 1920–24 the sheep stock was 1·52 million, between 1925 and 1929 it amounted to 1·68 million (in spite of the decrease). Between 1930 and 1934 it fell to 1·25 million and only showed some increase – to 1·42 million – in 1935–38 under the influence of the last years' favourable conditions.

The fluctuation of the individual components within the stock showed by and large the usual trend, that is, as seen from the figures, the changes in the economic conditions were felt especially in the stock of young animals, as the decrease, too, began here. In the period of growth the proportion of full-grown animals was around 70–72 per cent, and when the number of sheep began to decrease this

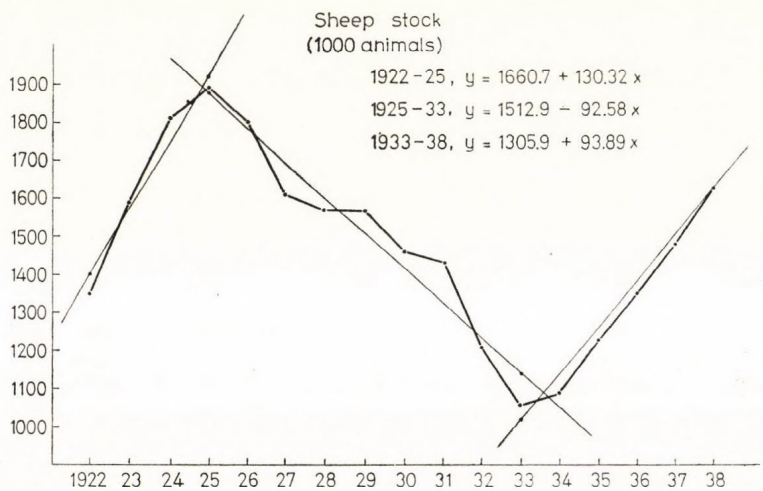


Fig. 31. Trend of the sheep stock, 1922–1938

proportion rose to more than 77 per cent. When the crisis was at its worst – in 1933–34 – the stock of full-grown animals stopped decreasing, and, at the same time, the number of young animals began already to increase indicating a prospective increase in the whole stock in subsequent years. A similar development though in the opposite direction took place in 1924–25 when the number of full-grown sheep increased, while the decrease of the young stock foreboded a subsequent decrease in the whole stock. A more detailed analysis thus provides a possibility for making conclusions on the basic trends of development. In any case, the stock of young animals was exposed to the changes in economic conditions to a greater extent, and was much more responsive to price fluctuations than the full-grown stock. If we take the young stock of 1924 as a basis, in 1933 (at the nadir) the number of young sheep was only 47–48 per cent of that in 1924, while the full-grown stock was even at its lowest level (in 1934) more than 58 per cent of its peak number (in 1925). The number of full-grown animals showed a much lower rate of fluctuation.

The full-grown stock displayed much steadier proportions than the young stock. Its fluctuation depended mainly on changes in the number of ewes; the ram stock was surprisingly stable, or more precisely: as opposed to the animal species discussed so far its proportion within the whole sheep stock did not show any decrease, while that of wethers was reduced to some extent, from 13·4–13·8 to 10·6 per cent in the period when the whole stock decreased. The proportion of wethers did not return to its former level even in the period of boom, which caused a certain degree of shift. The fluctuation of the full-grown stock was thus determined by fluctuations in the number of ewes, and throughout the period of decrease the aim seems to have been to maintain the stock of ewes. If we take the year with the highest stock number as a basis, the number of ewes only decreased to 60–61 per cent in the worst year (1933), but when compared to the average years it even exceeded 70 per cent. The base stock was thus formed by the ewes. The number of rams and wethers ranged between much wider limits following better the changes in the whole stock. In the worst year (1934) the stock of wethers hardly reached 45 per cent of the best year, and the number of rams was around 52–55 per cent of the highest number. The only more substantial structural change appeared in the wether stock whose hardly 2–3 per cent decrease at the end of the thirties, when otherwise the number of the stock increased, indicated the beginning of an essential structural change, although the decline seemed to be rather insignificant. However, as it was connected with overall economic and management problems we have to emphasize it.

A much greater shift took place within the stock of young animals as a consequence of decreases and increases in the total stock. Here the fluctuation was outstanding in the female stock, which in unfavourable years did not even reach 13 per cent compared to the former 16 per cent. Here the decrease only stopped at 46–47 per cent of the highest stock number which shows that within the whole of the young stock it was the number of females (tegs and ewes) that determinep the trend of development. The wether stock showed a relative stability regularly

ranging from 7 to 8 per cent. Some decrease occurred in the number of rams; at the lowest level (1933) the stock of young rams – though rather large in number – only made 41–42 per cent of the highest level.

Thus, within the total sheep stock no considerable structural changes could be spoken of. Only the changes in the wether stock were of such character as indicating to some extent a structural modification in the whole sheep stock. Apart from this the fluctuation of the stock reflected the effects of changes in the economic life which, however, did not break up its former structure.

We are in a more difficult position when examining the breed composition of the sheep stock, since the repeated animal census overlooked this aspect – perhaps because the sheep stock was of rather uniform appearance. As seen before, the proportion of merino sheep before the First World War was much larger on the post-war than on the entire pre-war territory of Hungary. In 1911 the proportion of the fine-wooled stock was about 70–71 per cent on the present area of the country. This proportion – based, of course, only on estimates, though on statistical ones – continued to increase with the overall decrease of the sheep stock. In 1935 the proportion of merino sheep within the sheep stock stated by the national census is estimated to have been 77 per cent; within the total number of stock revealed by the spring registration of the same year it exceeded 92 per cent.

The causes of the difference are obvious: not so much attention was paid to the coarse-wooled stock by the census, as to the merino breed, and on the distant poor quality grazing lands it was more difficult for access. We must not by any means draw the conclusion that 92–93 per cent of the total sheep stock was pure-bred merino. No doubt, however, that a considerable improvement took place in this field, the reduction of the stock affected firstly the less valuable breeds of "racka" and "cigája". Thus, as to the quality, an obvious improvement has to be spoken of, and not only in this field. Another phenomenon in this context, the partial replacement of the fine-wooled stock by derived but longer wooled, easier to comb breeds will be discussed later, here we only mention that the proportion of the long-wooled stock was about 5·2–6·8 per cent in the second half of the thirties, which meant a qualitative development and showed that sheep breeding – even if with some delay – attempted to keep abreast with the demands of industry.

The distribution of the sheep stock among the different regions of Hungary throws light upon the trends of sheep farming.

When examining the three major regions of the country we find a single, highly intensive process to have taken place, a decrease in sheep number in Transdanubia and the northern part of Hungary, and an increase in the Great Hungarian Plain. This was a process of elementary force which was influenced not only by the crisis. It is true that the first data are available from 1924, and from 1925 to 1934 the whole sheep stock decreased considerably – and mainly continuously –, it may be said that although in the period of an overall decrease of the sheep stock sheep-farming was reduced in Transdanubia and in the North, the situation could change in the period of upswing. The repression of sheep farming in Transdanubia was

Table 42. Sheep-farming trends between 1924 and 1938 (in thousands) in the different regions of Hungary(3)

Regions	1924	1925	1928	1931	1934	1938
Transdanubia	684	680	538	528	407	511
Great Hungarian Plain	785	850	684	631	468	819
Northern Hungary	346	355	340	280	210	296
Hungary, total	1 815	1 885	1 562	1 439	1 085	1 626

however, a more far-reaching tendency as proved by the fact that in 1924–25 when the total stock was increasing (reaching top in 1925), the number of sheep in Transdanubia stopped increasing at about 680 thousand, which in 1924 was 37·69 and in 1925, 37·08 per cent of the total stock. From then the sheep stock of Transdanubia fell rapidly to 530 thousand, then in 1934 reached bottom with a stock number of 407 thousand. In 1938 it was again 511 thousand which meant, however, only 31·43 per cent of the total stock. Thus, on the whole the sheep stock in Transdanubia was reduced by 25 per cent compared to the 1924 level. The decrease was particularly spectacular in the counties belonging to the sheep breeding districts such as Somogy, Tolna and Fejér. When comparing the situation of sheep farming in these counties with that of other livestock branches we can say that the sheep breeding of low profitability was replaced by cattle and pig breeding (Table 42).

A similar process took place in the northern counties. Here the stock fell by 15 per cent between 1924 and 1938, and although its decrease in number was not essential until 1928 (as shown by the fact that in 1924 the share of this region in the total sheep stock was 19·06 and in 1928 21·77 per cent), its proportion was 19·45 per cent in 1931, and only 18·20 per cent in 1938. The reduction of the stock was, however, more even here than in Transdanubia; with the exception of Borsod – Gömör – Kishont County (where it hardly exceeded 3 per cent) the decrease generally ranged from 10 to 20 per cent.

While in Transdanubia and on the northern areas the sheep stock uniformly decreased, its growth in the Great Hungarian Plain was the result of a series of opposed components. The share of this region in the total sheep stock increased rather evenly from 43·25 per cent in 1924 to 50·37 per cent by 1938. When expressed in numbers this increase – from 785 thousand in 1924 to 819 thousand by 1938 – does not seem so high, though the peak was 850 thousand sheep in 1925. The numerical growth of the sheep stock in the Great Hungarian Plain better reflects the changes in the economic situation than the sheep stock of other regions or of the country as a whole. It was characteristic of the whole situation that between 1934 and 1938, when with a new increase in the sheep stock a nation-wide change began, the bulk of growth occurred in the Great Hungarian Plain. In this period the sheep stock increased by 25 per cent in Transdanubia, 40 per cent on the northern areas and 77 per cent in the Great Hungarian Plain (compared to 1934), that is, the increase strengthened the share of the Great Plain in the total sheep stock.

On a national scale this shift reflected a favourable tendency, namely, to confine sheep farming to the poorer grazing lands and release the better pastures of Transdanubia for cattle breeding. This tendency was shown even within the Great Hungarian Plain. Beyond an increased share of this region as a whole in sheep farming, the growth of the sheep stock was far from uniform in the different counties. Between 1924 and 1938 the number of sheep only increased in counties of Bihar, Hajdú, Szabolcs and Szatmár where the quality of pastures was relatively poor. From 1934 to 1938 this increase was more than 120 per cent in Bihar, 113 per cent in Hajdú and 96 per cent in Szabolcs. The growth of the stock was about the same in Szatmár county too. As a result these four counties owned 50·79 per cent of the sheep stock in the Great Hungarian Plain (compared to 40·63 per cent in 1924). At the same time, in 1924, 17·57, in 1938 already 25·58 per cent of the total sheep stock of Hungary lived here. The centre of sheep farming shifted thus to the eastern sandy (alkali) areas of the country, that is, with the whole livestock farming taken into consideration, the rather extensive branch of sheep-farming developed in the Great Hungarian Plain, and the more intensive cattle breeding in Transdanubia, and through this the difference between the two main breeding districts further increased. Within the Great Hungarian Plain sheep farming was withdrawn from the Danube–Tisza Interfluve where the grazing area was somewhat reduced too.

All this means that the process which had already begun in sheep farming at the end of the last century, or beginning of this one, and during which this increasingly unprofitable branch, parallel with a decrease in the number of sheep, shifted to poorer quality grazing lands mainly in the sandy and alkali parts of the Great Hungarian Plain, culminated in the twenties and thirties. In these decades the situation completely changed: in the 19th century Transdanubia was the leading district of sheep farming – as regards the number of sheep too –, while in the twenties and thirties of the 20th century this role was taken over by the Great Hungarian Plain. This change reflects a double process: (1) the shift of the unprofitable sheep branch to otherwise unexploited districts, (2) a growing intensity of production in the western part of Hungary whereby the difference between the western and eastern side of the Danube became striking.

The decades examined represented a period of considerable qualitative development in the field of sheep breeding too. The increasing predominance of the merino breed as well as the fact that between 1920 and 1938 another large part of the sheep stock turned into a merino character have already been referred to. This in itself meant a substantial development. We have to emphasize, however, that at the time of the seemingly chronic crisis of sheep farming great and successful efforts were made to improve the three-way utilization – wool, meat and milk – of the sheep stock.

After the first world war a new tendency of development asserted itself: the introduction of combing-wooled sheep at the expense of felt- and fine-wooled sheep(4). The cause of this was the increasing demand of the textile industry for longer, combing wool. Breeding tried to adapt itself to the new demand and

change over to the combing-wool line. As seen, some results were attained in this field; in the second half of the thirties, about 7 per cent of the stock consisted of combing-wooled sheep. Besides the adaptation of the quality of wool to the demands of the industry, increased production was another consequence of the gradual replacement of the short-wooled sheep by the new breed. The new breed was more productive, produced more wool, and the percentage of pure wool was higher than in the old breeds. With the decrease of the short-wooled stock it was at the same time the beginning of a qualitative improvement. Attempts were made to increase the wool production of the combing merino too. On large-scale sheep farms a systematic selection took place first of all with wool production kept in view. Unfortunately, no data are available in this relation on a national scale, but on the basis of data on a few farms and according to the contemporary literature the development must have been rather substantial. There were farms where the output of wool per sheep increased by as much as 1–2 kg every year, which would have been such a great improvement as cannot be supposed to have occurred on a national scale, even if we take into consideration that the combing wool is of longer fleece, and its pure rendement is relatively higher than that of the short-fleeced felt wool. The rise in the general level was even more obvious from the fact that the decrease of wool production was of much lower rate than that of the sheep number, that is, between 1924 and 1934 the wool yield per sheep increased.

A substantial progress was made in the increase of milk yield. Before 1919 on the present area of Hungary sheep were only milked in a few places mainly in the Great Hungarian Plain and on the northern areas, mostly by small breeders, small peasants for family consumption. The racka and cigája stocks reared on the border areas of Hungary were milked and the demands for ewe-milk and milk products were met from these areas. After 1919 considerable development took place in this field, the proportion of milked ewes constantly increased, and by the second half of our period might have reached 50 per cent of the total stock(5). The amount of milk obtained from one ewe a year was about 15 litres, such a large quantity compared to consumption that ewe-cheese ("gomolya") – the object of milk production – could be regularly exported. Efforts to increase milk production especially were reinforced after the introduction(6) of "merinofort", for milk production in the sheep farms generally made it feasible.

Attempts were made to increase the meat production too. Under the effect of a more and more systematic selection work and up-to-date feeding methods, as well as in consequence of an import of French breeding stock(7) – especially in larger sheep farms – the average body weight increased, the body conformation improved which meant an increase in meat yield. This tendency manifested itself also in increased exports of broiler lamb(8), which was all the more characteristic because mutton consumption was not significant on a national scale (it did not even attain 10 per cent of the pork or beef consumption).

All three utilization forms of the sheep stock thus made a considerable progress following the introduction of up-to-date breeding principles and organization. The results of systematic selection were extended almost to the whole stock. True,

the National Association of Sheep Breeders was only established in 1937, i.e. at the end of the period concerned, but the principles – e.g. classification of flocks – this organization tried to introduce in practice had already been effective before. Herd-book registration too underwent an essential change; at that time the national herd-book covered a large proportion of the breeding stock, in which – naturally – some role was also played by the fact that it was in this region even before 1919 that sheep farming was carried on at the highest level in every respect. Nevertheless, this progress cannot be undersetimated. We have to mention here the government measures – first of all in the thirties – aimed at improving the breeding stock. The "popular" flocks were in great need of receiving fresh blood, so the ram action of the Ministry of Agriculture combined with a distribution of ewe lambs in the thirties(9) came just in time. The trend of the sire supply indicates just how important this was.

Sheep breeding was in every respect in a peculiar position, since no other animal species had ever been in such a situation that an average of 95 per cent of the sires was in private ownership. At the same time – as a concomitant of the former – 77–80 per cent of the total sheep stock was found in sheep-farms having sires of their own(10). This substantial difference was based on the fact that an overwhelming proportion of the sheep stock – 77 per cent in 1935 – was owned by large farms above 60 hectares, and these large flocks were always supplied with sires. The wealthier peasant breeders who had larger flocks also kept sires. On the other hand, a considerable part of the sheep maintained in a farm were usually not reproduced anywhere in the country except in counties Tolna and Baranya, where the products were used for cottage-industry purposes, and where even small farmers wished to reproduce their sheep.

Accordingly, the percentage of rams for service did not essentially change. The proportion of privately owned sires ranged from 94·4 to 95·8 per cent, but as for the whole period no substantial shift can be spoken of, the frames seem to have been firm. The proportion of sires in the breeding stock corresponded to the former. It was, however, a much more important circumstance that while the decrease in the number of privately owned sires did not exceed the average decrease in stock numbers, that is, in these stocks the sire supply did not worsen, in the common breeding stocks the ratio of ram for service to ewe was 1 : 109–110 in 1925, 1 : 106 in 1928, 1 : 120 in 1931, and in 1938 the number of ewes per ram exceeded 126. At the same time, in private flocks 21–22 ewes fell to one ram for service in each of the years examined. Thus, in private breeding the decrease corresponded to that of the total stock, while in common breeding – more closely affected by the crisis due to the financial difficulties of the government and the villages – the decrease surpassed by far any acceptable measure; it did not follow the fluctuations in stock number but showed a steady downward tendency (Table 43).

The situation of private breeding was favourable. The number of ewes per ram was 21–22 on a national average, which was highly satisfactory since according to the law 30–40 ewes ought to have been served by one ram in common breeding.

Region	Common breeding	Private breeding
Transdanubia	71	26
Great Hungarian Plain	194	18
Northern Hungary	149	20
Mean	126	21

Table 44. Regional distribution of sheep farming in 1938(11)

Such a high number was not found in private breeding in any county of Hungary, only some Transdanubian counties showed a ram/ewe ratio of 1 : 34. Within this favourable overall picture the individual regions show, however, considerable differences. Transdanubia with its ram/ewe ratio of 1 : 26 was apparently behind the northern areas (1 : 20), and mainly the Great Hungarian Plain (1 : 18). And even within the latter the situation of Szeged (1 : 4!) was outstanding, but in the Great Plain conditions generally were more favourable. The highest number of ewes per ram was 24. This number ranged from 18 to 23 in the northern counties, and from 23 to 34 in Transdanubia.

However, with respect to common breeding the situation is deplorable. The average number of ewes per ram was 126–127 on a national scale. But in the Great Hungarian Plain the main sheep farming district of Hungary, the number of ewes per ram was 194, while in the north 149 and in Transdanubia only 71. Thus the reduction of sheep-breeding in Transdanubia improved the conditions of the stock there, while in the Great Hungarian Plain the number of rams could not keep abreast with the growth of the stock. The situation was particularly serious in the eastern parts of the country, where the difference between the increasing stock and the number of sires grew enormously. In 1938 the ratio of ram to ewe in common breeding was 1 : 1 407 in Szabolcs County, and 1 : 1 622 in Szatmár County! This ratio seems unbelievable, and the unreliability of spring registrations has, in fact, often been spoken of. Still we do not believe that it could be simply traced back to this. It can hardly be supposed that registration in those two years was less precise than on other occasions, moreover even if we accept this, such a great difference could not have been produced solely by this. Namely, Csongrád County where "only" 809 and Pest County where "only" 804 ewes fell to one ram had a better organized state apparatus, and sheep farming was carried on under less extensive conditions than in the eastern parts of the country (although pasturing was not of much greater extent in this region either). It was surprising again, that the larger towns (Szeged, Debrecen, Hódmezővásárhely) did not maintain rams in common breeding at all.

On the northern areas of Hungary only Nógrád County showed an acceptable ram/ewe ratio (1 : 78), though even that was at least twice as high as prescribed. In other counties the number of ewes per ram ranged between 200 and 588 which made the common practice of sheep breeding quite absurd. It was only in Transdanubia that the situation was somewhat better. True, in counties Fejér, Somogy and Zala the ratio of ram to ewe was 1 : 240–650, but the several thousand sheep

found there obviously did not serve breeding purposes, and in other parts of Transdanubia the number of ewes per ram ranged between 34 and 65, which under the conditions prevailing at that time all over the country was a considerable achievement. This in itself shows that in Transdanubia sheep-farming was much more intensive than in other parts of the country.

In this deplorable situation of common breeding some compensation is offered by the fact that on a national scale the ratio of ram to ewe was 1 : 25–26 (which is – at the same time – an indirect evidence of the data of registration having not been too far from the facts). The mating of ewes was thus ensured almost exclusively through the ram stock of private sheep-farms. A similarly favourable phenomenon was the advantageous position of private sheep farms having the bulk of the sheep stock in their possession. This situation was further improved by the fact that the conditions of private sheep farms were the best in the Great Hungarian Plain, that is in the very place where sheep breeding began to grow, and 50 per cent of the total sheep stock was found. The sheep stock kept in common breeding, that is, first of all that owned by the peasantry, was undoubtedly at a disadvantage compared to large farms (including the half shares system of sheep farming), and the gap between the two types of sheep farming gradually increased. That is why neglecting of the sheep breeding in spite of a satisfactory ram supply was harmful. The breeding conception of the government only assigned an "auxiliary" role to common breeding, as one introducing fresh blood into the stock, whereby it left the small breeders at the mercy of large sheep farms.

Sheep breeding – as seen above – thus fell back. The epizootic diseases cannot be listed among the causes. Since the bulk of the sheep stock was maintained in large farms where controlling the different epizootic diseases was possible, epidemics did not cause much trouble – at least according to the statistics – during the whole period. The number of animals which perished or were slaughtered from illness did not reach 50 per cent of the total stock in any of the years, which is a great result(12). So there was no great danger threatening the stock in this regard.

Sheep farming was threatened to a much greater extent by the very low level of wool and sheep prices almost throughout the period concerned. The prices already began to fall in the middle of the twenties, and this had an extremely adverse effect on breeding. The main problem was caused by the situation of wool marketing. No more did the disintegration of the Monarchy and the rapid development of the Hungarian textile industry in the twenties change the conditions prevailing already at the end of the last century: separation of the textile industry from the domestic wool production. The Hungarian textile industry was not based on domestic wool production either. Before the crisis set in 90–92 per cent of the total volume of wool produced had, in fact, been exported, with a simultaneous importing of foreign wool and thread of a quality more favourable for industry(13). Under the pressure of low prices the sheep stock was reduced, and so was wool production, but a still greater decrease was shown by the export which could not endure the pressure of foreign markets. Since the main returns of sheep farming came from the selling of wool, and as large estates were particularly hard hit by the reduced

exports, being the bulk of the sheep stock maintained in farms larger than 60 ha, and 50 per cent in ones above 600 ha(14), the large estate owners and their organizations urged the government to improve the conditions of wool marketing. There seemed to be but a single solution: the rapidly developing textile industry whose production capacity would have been able to absorb the total volume of domestic wool production should have been forced to process wool produced in Hungary. And since it was a question of taking measures to reduce the imports which was favourable for the foreign trade balance too, the government took steps to realize this. In 1934 a decree was issued obliging the textile factories to take over the wool produced in Hungary at a fixed price(15). From that time wool imports were only allowed when the factories had already bought the domestic quota and the price had been paid to the breeder. The main point of this decree was that factories were only allowed to import as much foreign wool as they purchased from wool produced in Hungary. The "Futura", the government subsidized produce marketing enterprise, was obliged to take over any amount of wool left unbought by the factories, and the industry had to take it over from the Futura. The breeders and dealers were obliged to offer their wool supplies directly to the industry or to the Futura until 30th November every year. At the same time the decree introduced fixed prices. The state, naturally, had to grant a subsidy to the Futura or to the industry to maintain the prices at the appropriate level. So, through a government support, the production could be maintained, and even increased in the second half of the thirties, and at the beginning of the boom created by the war the government even succeeded in reducing the wool exports to a considerable extent. In 1935, 8·2, and in 1938 only 2·3 per cent of the produced amount were exported(16).

Efforts were made also in the field of marketing live sheep. Here the situation was just the opposite: initially the inland market was more important, then at the time of the crisis the export, primarily to France and Czechoslovakia as well as to Greece, came to play an increasing role. The French market was of the highest importance; its share in the live sheep export was 74, and in the total sheep exports of Hungary 55–60 per cent(17). Yet, until 1938 no considerable result could be attained in this field through monopolization of the foreign trade, because the French government assured the purchases in Hungary to French foreign trade enterprises. Where, however, no such reservation existed, e.g. toward Czechoslovakia, the export was monopolized in 1934 with the aim of pushing the trade into the background(18). Then in 1938 the sheep export was organized in the same way as the export of other animals. The government granted a substantial support to the export, sometimes up to 25–50 per cent of the price, alleviating thereby the situation of large sheep farms producing for export(19). As a result the export price of sheep exceeded by some 40–50 per cent the internal price level. This soon made its effect felt in the domestic prices too.

Attempts were made to increase the consumption of mutton too. As mentioned already mutton consumption was about 10 per cent of the amount consumed of beef and pork. The propaganda started with the view to increasing the consump-

tion of mutton failed because it involved a rise rather than a fall in prices. So in the years of the crisis the price of mutton attained that of the more expensive meat types (pork, beef). In the capital it was rivalled by the cheap horse meat. An overwhelming proportion of slaughtered sheep that could not be exported was consumed by the producers themselves. Still, it was not the mutton price, but the export that was given state support. The peculiarity of state supports is clearly shown in this circumstance too. Instead of supporting the price of mutton making it thereby cheaper and promoting its consumption, it increased the price paid to the producers – first of all to large estate owners –, and since under such conditions the propaganda failed, increased the consumption by force! In 1936 mutton consumption twice a week was compulsory introduced in the army(20).

The government measures taken to improve the marketing conditions were aimed at making sheep farming on the large estates as profitable as possible. Through the taxes the burden of supporting the sheep branch was shifted, after all, to the consumers. Until 1938 this was the result of the struggle between wholesale trade, industry and large estate.

Notes

(1) See Éber: op. cit. 405.
(2) Data of spring registration of useful animals. Annual OMK reports on the basis of data of statistical sheets (National Archives) and National Archives: Preparation of peace
(3) On the basis of spring registrations of useful animals and National Archives: Preparation of peace.
(4) The relevant views and literature are summarized in Éber: op. cit. 490–491. See further: annual OMK reports.
(5) For the data see Éber: op. cit. 489. When milk production came into prominence the inclusion of milk production data in the herd-books became necessary. OMK, 1933, 82.
(6) Ibid.
(7) Éber: op. cit. 426. See further: annual OMK reports and the volumes of "Magyarország földművelésügye . . ." (Agriculture in Hungary . . .)
(8) On the basis of the relevant volumes of Foreign Trade in Hungary (Magyar Statisztikai Közlemények). See further: Éber: op. cit. 487–488 and Szuhay: op. cit. 226. See further: annual OMK reports.
(9) Konkoly-Thege: op. cit. 48–49 and the volumes of "Magyarország földművelésügye . . ." (Agriculture in Hungary . . .).
(10) On the basis of the data of spring registrations of useful animals in the annual OMK reports.
(11) On the basis of data of spring registrations of useful animals, and National Archives: Preparation of peace.
(12) On the basis of data in the Hungarian Statistical Year-Books (Magyar Statisztikai Évkönyvek). See further: Konkoly-Thege: op. cit. 174. The author underlines the large number of unreported death cases, that is, the statistical data need correction in this regard. Yet, the situation must be regarded as favourable.
(13) For the price trends see Éber: op. cit. 482–483, Szuhay: op. cit. 229 and annual OMK reports (highly exhaustive). The prices fell even before the crisis: in 1924 the average

price of raw wool was 3·02 P while in 1926 only 2·17 P in Hungary (Matolcsy–Varga: The National Income of Hungary 97). For the wool exports see the relevant volumes of "Magyarország külkereskedelmi forgalma" (Magyar Statisztikai Közlemények) (Foreign Trade in Hungary), and Éber: op. cit. 483–484, Szuhay: op. cit. 229–230 and Pálinkás: op. cit. 29.

(14) Major operative data on Hungarian agriculture in 1935 according to farm size (Magyar Statisztikai Közlemények, New series, Vol. 112, 1941. Budapest). See further Éber: op. cit. 485–486, Szuhay: op. cit. 227.

(15) Szuhay: op. cit. 231–232, Éber: op. cit. 484.

(16) Szuhay: op. cit. 231–234.

(17) See the relevant volumes of foreign trade in Hungary (Magyar Statisztikai Közlemények), and Szuhay: op. cit. 226.

(18) Szuhay: op. cit. 227.

(19) For the details see Szuhay: op. cit. 228, Hegedüs: op. cit. 65–73.

(20) For detailed data on the regulation of mutton consumption see Éber: op. cit. 487–488 and Szuhay: op. cit. 228–229. See further the annual OMK reports.

Chapter 13 Poultry farming

Assessing the position and development between 1920 and 1938 of poultry farming, of basic importance in the livestock husbandry and agricultural export of Hungary, is a highly complicated task. Poultry farming is a particularly multi-purpose branch, and hardly any data for comparison are available from the earlier periods. Even the most essential statistical data are lacking, as the spring registrations of animals were not extended to include the poultry stock. In the course of a nation-wide animal census, such as those in 1911 and 1935, the poultry stock was, naturally, also recorded; however, with poultry any comparison would be extremely unreliable, not only because of the change in the territory of Hungary, but also because the poultry number varies very quickly, any increase or decrease in the stock is relatively easy to carry out, so a comparison of two years' data would not disclose the basic conditions and their changes.

From 1928, though, the results of another statistical survey of the poultry stock of Hungary (although only that possessed by landowners) are at our disposal, and with their help the main tendencies of development, at least for the seven-year period between the two surveys, could perhaps be disclosed, this task is, however, almost insolvable. Namely, the two surveys were made with a two months' difference: the 1935 survey on 28 February, while that in 1928 on 1 May. This difference in time in the case of poultry, which even within a one-year period changes at a very rapid rate, gives results which are impossible to compare.

But there are deficiencies in respect to other data too, e.g. those required for judging the situation of marketing. The prices were not traced – especially in the twenties – in the different parts of the country, and the extent of internal consumption too can only approximately be established. The export data though are at our disposal, since the exports of live and slaughtered poultry, eggs and feather made some 10–12 per cent of the total Hungarian exports, and within it 18–20 per cent of the agricultural exports and 30–35 per cent of the export of livestock products, being thus of extremely great importance for the foreign trade balance, but the data on internal production and consumption are even less sufficient than – say – the slaughterhouse data in cattle utilization, which is a similarly unreliable basis.

In spite of all these difficulties the situation of poultry farming has to be discussed. Namely, the rather neglected poultry breeding was – as mentioned before – of great importance from more than one point of view. Furthermore, in spite of the relatively extensive character of Hungarian agriculture, the still more extensive branch of poultry farming was a highly profitable enterprise. With the prevailing

shortage of fodder the economic importance of poultry farming utilizing the scattered seeds, and destroying the harmful insects and weed seeds was not to be belittled either. It deserves attention if only because poultry farming was concentrated in the peasant farms, and as such had an important role in ensuring an income for the peasantry, mainly the small peasants. According to the not always reliable statistical data, in certain places, in the large livestock districts of the Great Hungarian Plain, poultry farming (selling of live poultry, eggs and feather) had a larger share in the incomes of peasant farms than milk marketing(1). For this very reason in the food supply of the village population poultry farming had a less significant share than would be expected on the basis of its economic importance, but its role in the whole agricultural production was much greater than that.

The trend of the number of poultry throughout the period concerned cannot be followed, for to establish the size of the poultry stock left on the new territory of Hungary on the basis of statistical surveys made before 1914 is just as problematic. Therefore the data of both animal censuses had to be taken into consideration for the purposes of an analysis. Accordingly, at the time of the survey in 1935 the number of various kinds of poultry was 22·9 million in Hungary.

The thirty million poultry stock can be regarded as an average in the inter-war period, representing neither the highest nor the lowest number of the stock. The trend of the poultry number is probably best characterized by a sharply ascending curve starting from the nadir, which at the end of the twenties again turned downwards, and only began to ascend in the second half of the thirties, after the economic crisis, under the influence of a developing boom. Thus the 1935 survey shows the poultry stock at the best time if we want to assess the average situation (Table 44).

Within the poultry stock the gallinaceae were the largest in number representing more than 77 per cent of the total stock. In the course of development the inner structure of the stock shifted even more in this direction. If the 1928 census can be taken into account in this regard we can say that the proportion of gallinaceae showed some increase by 1935 compared to the earlier period. The proportions of turkey and duck also rose while that of the goose decreased during these seven years. We must be very careful, however, in considering these proportions, as the surveys made at different times registered stocks of different structure even if with the interrelated proportions the error must have been much smaller than in the case of absolute numbers. This is shown by the fact that the exports of ducks as well as of goose fat and liver multipled in this period, and this process ran parallel with the outlined shift in the inner structure of the stock.

As mentioned before, poultry farming was mainly in the hands of the peasantry. This fact is excellently shown by the statistical survey made in 1935, according to which(2) 89·8 per cent of the total poultry stock was owned by peasants with less than 60 ha lands each, and only 10·2 per cent was found in farms larger than 60 ha. 37·8 per cent of the poultry stock was owned by dwarf holders with lands below 3 ha each, which shows the great dominance of this farm group in poultry

Table 44. Distribution of the poultry stock (million fowls) in 1928 and 1935(3)

Time	Gallinaceae	Goose	Duck	Turkey	Pigeon	Total
Number of the stock on 1st May 1928	28·7	4·7	3·3	0·8	1·3	38·8
of which the current year's growth	19·7	3·8	2·6	0·6	0·5	27·2
Percentage	68·7	81·2	81·8	77·5	37·2	—
Number of the stock on 28th February 1935	17·9	2·3	1·4	0·4	1·0	23·0
Probable stock number on 1st May 1935	40·0	8·5	5·7	1·2	1·5	56·9
Surplus compared to 1928 (in per cent)	40	80	80	54	10—20	47
Estimated highest mid-year stock number	43·0	9·4	6·0	1·4	1·6	61·4
Estimated current year's progeny	40·0	9·0	6·0	1·6	0·8	57·4
Estimated annual use	30·0	6·7	4·5	1·2	0·6	43·0
Annual average number	27·8	6·0	4·0	1·0	1·5	40·3

farming and vice-versa: the importance of poultry farming in the life of these farms. Farms smaller than 12 ha reared 71·8 per cent of the total poultry stock. It was only in turkey breeding that large farms played a more important role; 37 per cent of the turkeys was owned by farms below 12 ha, and 35·7 per cent was found in farms between 12 and 60 ha. The role played by farms larger than 60 ha in turkey breeding exceeded by far their part in other poultry branches; their share in the total turkey stock is estimated to have been 27·3 per cent. It is quite obvious that the poultry, through which the otherwise wasted fodder (scattered small seeds in the field, and in the farmyard, etc.) could be utilized, was in that period at its best place in the small peasant farms, where – in accordance with the extensive conditions – the necessary feed and labour were available. Larger farms were engaged in poultry farming less frequently. The attempts made in the twenties to introduce farm-scale production likewise failed. At the very beginning of the crisis the competition of small farms producing at an extremely low cost due to the low living standards swept away these poultry farms established in 1927–1928 without any agricultural background. It was for the same reason that the incubator of which the first electrically-heated type appeared in the early thirties could not be widely introduced. Initially the government tried to support them hoping to improve thereby the situation of poultry farming, and only when these attempts failed returned to the traditional method of improving the breeds.

According to data of 1935 there were certain differences between the larger regional units in the percentage distribution of poultry farming. While in the Great Hungarian Plain and Transdanubia the poultry stock of peasant farms made

up 91 and 87·7 per cent of the total stock, respectively, on the northern areas where the possibilities of field production were much more limited than elsewhere, 93·2 per cent of the total poultry stock was owned by peasants. And within this, 49·6 per cent of the stock was found in farms smaller than 3 ha, so their proportion was remarkably large. On the other hand, in Transdanubia farms over 60 ha had the largest share in poultry farming, with 12·3 per cent of the stock in their possession. It is a remarkable feature, though of less importance that the largest share of the poultry stock in non-peasant possession was to be found in the Great Plain on farms between 60 and 600 ha, while in Transdanubia in those above 600 ha. There were, however, some districts in the country where special conditions prevailed, so e.g. farms larger than 600 ha owned 14·5 per cent of the total stock in Fejér County, and 10·4 per cent in Somogy County. Parallel to this in the counties of Fejér and Zala, dwarf holdings below 5 cad. yoke had also a larger than average share in poultry-farming. At the same time, in Baranya County 92·5 per cent of the total stock was found in farms smaller than 60 ha, of which, however, an overwhelming part (62 per cent) fell to those between 3 and 60 ha, while dwarf farms below 3 ha only owned 30·5 per cent of the total stock, sharing thus in poultry farming to a much lower extent than the Transdanubian average. In the Great Hungarian Plain, on the other hand, the peasantry of Pest and Szabolcs Counties possessing lands below 3 ha owned 40·1 and 45·2 per cent, respectively, of the poultry stock, and Szabolcs was at the same time one of the centres of large-scale poultry breeding, since farms between 60 and 600 ha owned 7·7 per cent of the total stock(4).

It is easy to imagine the condition of the poultry stock maintained under extensive conditions mainly in small peasant farms and dwarf holdings. The general situation was even more complicated by the four war years, so a 35–40 per cent estimated loss in post-war years cannot be considered pessimistic(5). There were regions where the total poultry stock of settlements perished every year. And even if the situation became better by the mid-twenties, the diseases really caused very great damages in the whole period. The death cases were not recorded by the statistics, but it is beyond question that besides the fortunately rather infrequent fowl plague other diseases, especially cholera, tuberculosis, etc. also caused serious losses in the poultry stock.

There was much trouble with the breeds too. No uniform type of poultry was found in the country, breeding was characterized by a high diversity of colour, size and quality of fowls. The dwarf farms did not, naturally, bring fattened poultry to the market, thus, it mostly was not the producer who carried out the fattening. Of course, the highly mixed stock could not be sold at a high price. The agricultural policy of Hungary was aimed, therefore, at introducing such breeds, or – by improving the Hungarian local breed – producing such a stock as meeting the export requirements too. Namely, the Hungarian poultry generally was of small body size, the egg produced was also relatively small and different in colour from that sought after on the world market; therefore it mostly sold at a low price. Consequently, the objectives of breeding were: an increased body weight, higher

egg production, larger and darker eggs. At the beginning Plymouth and Orpington breeds were generally used to improve the Hungarian stock. About this time the end of the twenties the introduction of the then fashionable breeds of leghorn and Rhode Island started. The leghorn did not eventually prove good as – besides its indisputably high egg production – its brooding capacity was not sufficient, and did not even fulfil the expectations of increasing the average body weight of the stock. So it was the Rhode Island breed that became wide-spread. Between 1928 and 1934, in the first years of an intensive breeding activity, 11 600 Rhode Island, 1 050 Hungarian improved, 125 leghorn cocks; 4 097 Rhode Island and 420 Hungarian improved hens; furthermore, 350 Peking ducks, 113 bronze turkeys and 20 Emden geese were distributed in the framework of a poultry exchange scheme(6). Later this improving activity further increased, with considerable results which – though encountered every now and then – cannot be statistically assessed, since the necessary data are not available. It is beyond question, however, that this breeding activity contributed to the gradually increasing export of poultry.

The favourable properties of the Hungarian poultry: unexacting character, good feed conversion, multifarious utilization, tasteful meat and rapid development justified the efforts of improving the Hungarian stock. These efforts were promoted by the National Association of Poultry Breeders, one of the oldest livestock breeding organizations in Hungary. The joint result of the government activity and private efforts was the improvement mentioned above. It could be seen in the breeding, management and feeding conditions of not only the gallinaceae, but also of geese, ducks and turkeys, and manifested itself in a more uniform character of the stock, increased size and weight of body, and last but not least higher egg yields. According to calculations by the end of the thirties the egg yield per hen increased by an average of 20 eggs, which means a substantial increase and explains how besides the growing exports the internal consumption demands could be satisfied. The shape and colour of the egg improved and its weight increased. Egg production in winter became more favourable too. Thus, the increased exports were the result of all these efforts – an essential qualitative improvement(7).

No doubt, the increased export was not exclusively the result of the producers' work, and even the profit was not primarily skimmed by them. That is, the producers may even have had a relatively lower profit than the usual. Small peasant farms – with a few exceptions – supplied an extremely mixed mass of commodity which had to be processed to be suitable for export purposes. Fattening carried on by the producers was of minor importance, they only could benefit by plucking feathers where they could utilize the surplus labour of the family. And even if the overwhelming part of the profit was in this way realized in the trade too, poultry farming did mean as much for the producers as to make it worthwhile dealing with its marketing.

The trend of the poultry export had two characteristic features. One of them was the constant increase in volume from the second half of the twenties to 1938.

During this period the total export was almost redoubled, in certain products even multiplied. The other characteristic feature was the constant decline in prices, not only during the crisis but even subsequently; in 1938 poultry prices hardly reached 62 per cent of the 1929 level.

Parallel with this process we have to pay attention to another interesting phenomenon, namely, the trade – making use of the crisis, that is, of the fall in export prices – gradually increased its profit. The share of trade from the original price of the exported poultry became larger and larger. According to contemporary calculations the profit of trade was 12–16 per cent in the twenties, and 18·5–25 per cent in the thirties; in absolute numbers: 36 fillérs in 1925–27, and 50 fillérs in 1932–33 after each exported fowl. After 1933 the profit of trade was 39 fillérs per exported fowl – that is more than in the twenties – in spite of a continuous fall in prices(8). Besides the fact that the development of this young branch of trade was completed at that time, so the increased profit reflected the excellent work of the trade too, first of all the monopolistic position of trade enterprises was responsible for the above situation.

The production of the Great Hungarian Plain was exported, in fact, by two large firms: Schneider Ignác Utódai and Benedek József és Fiai; the profit was skimmed by these two. They excluded the possibility of competition and created a monopolistic situation on this enormous market. Their position was well characterized by the fact that later, when exports were managed in the framework of an association, and the enterprises shared in it in proportion to their former business turnover, the share of the Schneider firm was 23·08 per cent, that of the Benedek firm 14·20 per cent; that is, these two enterprises took 37·28 per cent of the return in the poultry export(9). It can be well imagined what the monopoly of these firms meant for the small peasant producers who were not organized and not even supported by the state.

In spite of the fact that poultry farming was mostly concentrated in the peasant farms, the government had to see to it that the incomes of the peasantry did not decrease. Just because a considerable part of the peasant incomes originated from poultry farming, the price of poultry was not uninteresting from the point of view of the peasantry. In spite of this, it was not in the exports of gallinaceae or ducks, but in that of the turkey that monopolization began. As to the causes it is enough to say that the difficulties arising in the English import justified the government in monopolizing the turkey export. Besides this, it became urgent because it was especially the turkey export that affected the interests of large estate owners to a considerable extent. For the management of exports the National Committee for Poultry Export was established in 1934, which besides the organization of export had the primary task of controlling the prices and maintaining them at an adequate level(10).

The final monopolization of the poultry and egg exports took place in 1937, when the Hungarian Poultry and Egg Export Association was established. Initially it only served the monopolization of the trade(11), its activity was concentrated on this objective. True, the "Hangya" was charged with the task of ensuring the

minimum prices, but since the scope of their validity was very narrow, extending only to commodities purchased for export, the association was nothing else than an organization safeguarding the interests of exporters until its reorganization in 1938. The bulk of export quotas – a round 48 per cent – was then given to the "Hangya". In 1938 the exports of goose liver and goose fat – in which the "Hangya" played a similarly important role – were also monopolized(12).

After the exports of poultry and eggs the export of feather was also monopolized The feather export was more reactive to the crisis than the exports of poultry and eggs, since beside the fall in prices the volume of export decreased to a great extent too. After the crisis prices increased again, but not sufficiently, although the feather prices were of great social importance, as they provided a basis of living for the poorest peasant strata. Thus, the monopolization of the feather export 15 October 1934, when the Export Association of Hungarian Feather Merchants was established, had a sort of social political orientation playing a role in the marketing of poultry in general, and in that of feather in particular. Besides the exporters the co-operatives were also admitted to the Association, so the "Hangya" Co-operative increased its share in the export, supplying 10 per cent in 1935, but in 1936 already 15 per cent of it. Its share did not grow larger until 1938 due to a lack of experts (13).

The government granted a regular price support to the export of feather. The increase in purchase prices was accounted for partly by this, partly by the monopolization. In the early thirties 40 per cent of the export prices fell to the share of the producers, and in the second half of the thirties this proportion even increased. Namely, buying up prices increased at a more rapid rate than export prices. This circumstance plainly reflected the effectiveness of the government's social policy, and so did the increasing role of the "Hangya" in the management of the export. When the monopoly was reorganized in 1938, in the new association (Hungarian Feather Export Association) the "Hangya" already had a leading part(14).

Notes

(1) See the annual OMK reports, especially OMK, 1937, 183. M. Polányi: Baromfitenyésztésünk, mint mezőgazdaságunk és kiviteli forgalmunk legszámottevőbb tényezője (Poultry farming, the most important factor of agriculture and foreign trade in Hungary). Budapest, 1928. L. Schweng: A tojás- és baromfitermelés rentabilitása (Remunerativeness of egg and poultry production). Dissertation. Budapest, 1939.

(2) On the basis of "Magyarország mezőgazdaságának főbb üzemi adatai . . ." (Major operative data of agriculture in Hungary . . .). Magyar Statisztikai Közlemények. New series, Vol. 112. See further Éber: op. cit. 493.

(3) Á. Ujlaki Nagy: Élelmiszertermelésünk és ellátásunk (Food production and supply in Hungary). Budapest, 1943, 329.

(4) The distribution of the poultry stock in 1928 may serve as a basis for comparison. Accordingly, 47·1 per cent of the total stock was found in the Great Hungarian Plain, 41·3 per cent in Transdanubia and 11·6 per cent on the northern areas of the country. In Transdanubia the largest number of poultry was found in Zala and Baranya Counties,

while in the Great Plain in the towns of Szeged and Hódmezővásárhely. The proportion of gallinaceae was the highest—78·1 per cent—in Transdanubia (in the Great Plain it was 70 and in the North 74·8 per cent). Turkey was found in the highest numbers in the Great Hungarian Plain where it made up 3·2 per cent of the total poultry stock (its proportion was 1·1 per cent in the northern part of Hungary, and 0·8 per cent in Transdanubia). Nearly half of the goose stock was found in the Great Plain, and the ducks were also concentrated here.

Percentage distribution of the poultry stock according to farm size

	Below 12 ha	Between 12 and 60 ha	Between 60 and 600 ha	Over 600 ha	Total
Gallinaceae	77·1	15·3	4·1	3·5	100·0
Turkey	46·9	32·3	15·4	5·4	100·0
Duck	71·4	18·6	5·8	4·2	100·0
Goose	73·8	19·0	4·4	1·9	100·0
Pigeon	53·3	33·4	8·8	4·5	100·0
Mean	74·8	17·1	4·7	3·4	100·0

(Magyarország földművelésügye . . . [Agriculture in Hungary] 1938, 73–75 and Statisztikai Szemle, 1929, 272. L. Pákozdy: A magyar baromfi és tojás termelésének és értékesítésének válsága és kivezető útjai [Production and marketing crisis, as well as perspectives of poultry and eggs in Hungary]. Hódmezővásárhely, 1933.)

Within the individual regional units greater differences too can be pointed out; e.g. farms smaller than 12 ha possessed 69·3 per cent of the total poultry stock in the Great Hungarian Plain, 79·4 per cent in Transdanubia and 80·4 per cent in the North. In farms between 12 and 60 ha 12·4 per cent of the stock was found in Transdanubia, 22·6 per cent in the Great Plain and only 11 per cent in the northern part of the country. We must emphasize here, too, that the stock stated by statistics to have been possessed by the large farms consisted, in fact, of poultry raised by the servants; poultry stocks of any considerable size were very few in number (Magyar Statisztikai Szemle, 1929, 275–276).

(5) Konkoly-Thege: op. cit.

(6) Ibid. 53. further: annual OMK reports. See further Éber: op. cit. 501–502. For the first years see the details in the relevant volumes of "Magyarország földművelésügye . . . (Agriculture in Hungary . . .), especially 1923–1925, 17; 1926, 16; 1927, 14, etc. It was characteristic of the breeding poultry campaign of the thirties that in 1933 11 528, Rhode Island cocks and 179 Peking ducks (Magyarország földművelésügye . . . 1933, 16 and OMK, 1933, 83), while in 1936, 18 730 breeding poultry (Magyarország földművelésügye . . . 1936, 15) were distributed. For the disadvantages of the leghorn breed see Mezőgazdasági Közlöny, 1936, 271–294. A comparative study of the Hungarian dunghill hen: L. Bakoss: A fehér magyar parlagi tyúk tenyésztési és termelési adatai. Összehasonlító kísérletek a rhode island és fehér leghorn fajtákkal (Breeding and production data of the white Hungarian local hen. Comparative trials with the Rhode Island and white leghorn breeds). Budapest, 1934. For the most important breeds see: Fajtaleírása a Magyarországon leggyakrabban előforduló baromfifajtáknak (Description of the most frequent poultry breeds in Hungary). Budapest, 1932.

(7) For the trend of export see: the relevant volumes on the Hungarian foreign trade (Magyar Statisztikai Közlemények), and Éber: op. cit. 497–499 and Szuhay: op. cit. 234–235. An excellent summary of the development is given in Konkoly-Thege: op. cit. 52–55. See further Éber: op. cit. 501 and Ujlaki Nagy: op. cit. 219.

(8) Szuhay: op. cit. 235.

(9) Erdei: op. cit. 130–131, Szuhay: op. cit. 236–240.
(10) Szuhay: op. cit. 236–237. For the critical situation see: Pákozdy: op. cit.
(11) Szuhay: op. cit. 237–238.
(12) Ibid. 240–242. For the details see Wünscher: op. cit. 223–230, Hegedüs: op. cit. 23–27.
(13) Szuhay: op. cit. 242–244. See further: annual OMK reports and Hegedüs: op. cit. 135–139, Wünscher: op. cit. 218–219.
(14) Ibid. F. Honcz–A. Dörner: Tolltermelés és értékesítés (Production and marketing of feather). Budapest, 1938.

Chapter 14 The other livestock branches

There were many other animal species reared in Hungary whose national economic role – though multifarious – was of minor importance. It was, in fact, only goat farming and apiculture that affected – though differently – the wider strata of the population. A common feature of the two branches was that not only farms but also certain categories of the urban population were engaged in them.

Goat was in Hungary, like everywhere in Europe except the Mediterranean countries, an animal of the poorest strata of the population. It had a special importance in the poorer working-class families. Most workers – unskilled workers – living in the suburbs of larger towns reared goats; in 1935, 27·5 per cent of the total number of goats in Hungary was found in the suburbs of Budapest. The rest was owned by peasants with dwarf holdings (1–2 ha). The goat was almost the only useful animal in these strata whose proportion to the totally landless population was increased by the land reform of 1920.

In the years of inflation following the First World War, when the milk supply of towns dropped considerably, the number of goats was relatively high – in 1921 65 000 – in Hungary. With the economic stabilization their number fell rapidly, in 1930 only 22 000 goats were recorded. This number remained more or less the same to the end of the thirties, when it began to grow again. Goat breeding generally was neglected, unlike e.g. in Denmark and Germany, where it was even supported by the state. It was only during the economic world crisis, when attention was called to the social importance of goat breeding, that government measures were taken to increase the milk yield (to about 5–600 litres a year) by importing he-goats from Switzerland.

Apiculture affected a much wider strata of the population, since one or two bee-hives were kept in every peasant farm, in certain large estates, and even in the urban homes of the low middle class. Differences were found only in the method of bee-keeping. The poor and middle strata of the peasantry used traditional bee-skeps. The more up-to-date bee-hives were used almost exclusively among the wealthier peasants, landowners, and urban apiculturists (craftsmen, skilled workers, clerks, village teachers). Apiculture was carried out on a small scale. An apiculturist had 6–9 bee families on the average. In the twenties 234–250 thousand bee families were kept by 29–33 thousand apiculturists in Hungary. In the thirties the number of bee families – due to the favourable export possibilities – rapidly grew, in 1937 more than 400 000 bee families were reared already by 43 000 apiculturists. This increase in the number of bee families was shown exclusively among the

apiculturists working with modern bee-hives, indicating the market orientation of these strata; those rearing bees in skeps continued to produce for self-support. The export ranged between 2 200 and 4 200 q a year on an average, but in 1937 it was as much as 7 400 q. The domestic consumption was very low (an average of half a pound a year).

The other livestock branches were of secondary importance. Ass and mule were maintained in small numbers even before the First World War, and their importance only decreased between 1920 and 1938 (in 1938 the number of asses was 4 056, and that of mules 1 192 in Hungary). Silkworm breeding was pushed into the background by the production of artificial silk. After 1945 cocoons practically ceased to be produced (in 1938, 14 658 breeders produced 267 199 cocoons).

On the other hand, the importance of fishing and fish management grew, and its forms were modernized. The traditional method of fishing came to a crisis already at the end of the 19th century. The first artificial fish pond was established in 1894. This branch of agriculture had an upswing after the First World War; by 1930 fish ponds were established at 150 sites, on a total of 10 thousand ha of water surface. In all of these fish ponds without exception carp was cultured. The annual fish yield was about 7 500 tons of which 3–3 500 tons were produced by fish ponds. The export of fish increased too, amounting to 11–12 thousand q in the thirties.

Rabbit rearing and wildlife management were also of some importance. Both branches showed a considerable development between 1920 and 1938. From 1934 to 1939, 6 000 deers, 1 100 fallow deers, 12 000 roe deers, 1 500 wild boars, 320 000 pheasants, and about 1 million hares were shot. Forty per cent or so of the shot game was exported.

Chapter 15 Structural changes in the animal husbandry

After surveying the individual branches of livestock farming, let us have a look at the changes in the livestock, the shifts taking place in its structure. We can do this by making our investigations on the basis of a stock number expressed in standard animal. We have to find a common basis to be able to follow the changes in the size of livestock, shifts in its structure, distribution among the regions of the country, and to find out what changes occurred in this field during the two decades studied. Otherwise we cannot make comparisons. There is no need – of course – to recalculate all data concerning the livestock, it is enough to make this calculation for the years indicating the main turning points of development. Moreover it is not possible to do this for each animal species either. To simplify the calculation we shall omit the goats, asses and mules from the calculations. Owing to a lack of data the poultry stock too has to be left out, so our investigations will be confined to the four main animal species (cattle, horse, pig and sheep). What was thus the trend of livestock numbers in Hungary between 1920 and 1938, when expressed in standard animals?

The overall examination of the livestock (Table 45) does not, in fact lead to results other than what have been obtained when analysing the branches of livestock farming separately; the size of the total livestock expressed in standard animal did not reach the 1911 level during the two decades concerned, and so, compared to prewar times the number of livestock decreased. The decrease – though occurring in each species – was not uniform. Its rate, and smaller or larger fluctuations followed the changes of the economic conditions mentioned before.

In comparison with the 1911 level the ratio of horses and pigs increased, that

Table 45. The trend of livestock number expressed in standard animal between 1924 and 1938(1)

Year	Cattle		Horse		Pig		Sheep		Total	
	1000 head	%	1000 head	%	1000 head	%	1000 head	%	1000 head	%
1911	1 719·8	57·8	717·2	24·0	378·8	12·6	171·8	5·6	2 987·5	100·0
1924	1 513·6	58·3	676·8	26·0	279·8	10·8	127·1	4·9	2 597·3	100·0
1925	1 532·8	57·6	697·6	26·2	300·2	11·3	132·0	4·9	2 662·6	100·0
1928	1 448·8	55·9	732·0	28·2	303·3	11·7	109·4	4·2	2 693·5	100·0
1931	1 449·6	56·9	689·6	27·1	309·2	12·1	100·7	3·9	2 549·1	100·0
1934	1 336·0	57·2	638·4	27·4	284·9	12·2	76·0	3·2	2 335·3	100·0
1938	1 504·8	57·4	649·6	24·8	354·2	13·5	113·8	4·3	2 622·4	100·0

of cattle remained roughly the same, while the ratio of sheep decidedly decreased by the early twenties. In the course of the twenties and thirties the structure of the livestock continued to change. The ratio of cattle within the total livestock decreased, and only showed some increase by the end of the period again; the horse stock, and to a considerable extent the sheep stock also decreased in proportions. The only animal species increasing stepwise was the pig whose share within the total livestock gradually increased, considerably exceeding by 1938 even the 1911 level.

The data of Table 45 reflect the earlier mentioned periodicity of livestock farming. With these the changes occurring in the meanwhile in the structure of livestock can be outlined. The number of the livestock – as expressed in standard animal – was the highest in 1925 and the lowest in 1934. Characteristically of the period between these two years the number of the horse and pig stock increased, while that of the cattle and sheep stock decreased. The change became obvious in 1938, at the time of the new boom (although the sheep number was forcefully increased). The ratio of the cattle stock did not substantially improve in spite of an increase in the number of cattle; on the contrary, it was lower than in 1924–25. The ratio of the horse stock became essentially lower, and the same applies to the sheep stock, whose share – though increasing between 1934 and 1938 parallel with an almost 50 per cent rise in the number of sheep – remained below the 1924–25 level. The changes in the structure of the livestock are thus clear. The question is how this change affected the individual regions of the country. Was there any difference between them? (See Figures 32 and 33 later).

The livestock of Hungary was not evenly distributed among the major regional units, and was not uniformly affected by the changes between 1920 and 1938 either. In 1938 the livestock – even when expressed in standard animal – was larger in Transdanubia, smaller in the Great Hungarian Plain and unchanged on the northern areas compared to the 1924–1925 conditions. All this resulted in a shift of the shares of individual regions in the livestock, in favour of Transdanubia. And there were changes even within this. The pace of change was not the same for each region either. As seen in the detailed analyses, the components of the livestock did not develop uniformly in the different regions; now we have the opportunity of studying these changes in comparison with each other. In Transdanubia the share of the cattle stock, and even more so that of the pig stock within the total livestock increased at the expense of the sheep and horse stock. Thus, when considering the period as a whole, in Transdanubia the proportion of the more intensive animal species increased, while the more extensive branches of livestock farming were concentrated in the Great Hungarian Plain.

This process became expressed in the period between 1934 and 1938, even if the decrease in the number of sheep can be considered to have been even after 1925. At the same time, a decrease in the number of the cattle stock, stagnation of the horse stock, an increased share of the sheep stock by 1938, and a substantial growth in the number of the pig stock were specific features of the Great Hungarian Plain. The increase in the number of sheep and pigs in this region took

place, after all, at the expense of cattle which makes it characteristically different from Transdanubia. In the Great Hungarian Plain the number of cattle decreased even at a time when in Transdanubia it increased (between 1934 and 1938). In a characteristic way, in the Great Hungarian Plain the decrease was always greater, while the increase in the number of livestock was usually less than in Transdanubia. It should be pointed out too, that the changes in the horse stock in the Great Plain were different from those in Transdanubia. In the Great Hungarian Plain the horse stock grew steadily between 1924 and 1931, while in Transdanubia it gradually decreased from 1928. In the pig stock the changes were not in unison, while in the sheep stock the differences were felt first, between 1934 and 1938. In the North the share of cattle in the livestock increased constantly, though not substantially; even in 1934 it was higher than in 1924–25. Here too, the rapid growth of the pig stock at the expense of the horse, and mainly of the sheep, was conspicuous.

If we want to show how the relation between standard animal number and territory changed on a national scale and in the different regions, respectively, we have to consider two series of data, and relate the changes in the livestock to the arable area, and the agriculturally utilized are (Table 46).

In general, there was no considerable change in livestock density, except for the first half of the thirties when the density of livestock related to agricultural area decreased. Even this decrease was, however, balanced out by 1938. Considering the individual regions, nevertheless, we can find essential differences. Compared to the 1925 situation, the livestock related to both the arable and the agricultural area by 1938 grew in Transdanubia, and decreased in the Great Hungarian Plain and in the northern part of the country; thus, in spite of an apparent stability a considerable shift occurred within the livestock in favour of Transdanubia. With respect to the individual animal species, changes took place in their numbers too. In Transdanubia e.g. the density of cattle and pig increased, while that of the horse and sheep decreased, and rather significantly at that. In spite of an overall decrease, in the Great Hungarian Plain the density of pig and sheep increased, though this growth could not compensate for the changes occurring in the density of cattle and horse. In the northern hilly regions, however, only the pig stock rose, while the density of cattle, horse and sheep became equally lower. But neither the cattle

Table 46. Livestock density in standard animal(2)

Year	Number of standard animal per 60 ha arable area				60 ha agricultural area			
	Hungary total	Trans-danubia	Great Hungarian Plain	Northern Hungary	Hungary total	Trans-danubia	Great Hungarian Plain	Northern Hungary
1925	27·4	33·9	22·5	28·1	20·2	24·9	16·8	19·6
1928	26·7	32·1	22·4	28·1	19·7	23·6	16·7	19·6
1931	26·2	32·6	21·2	27·6	19·4	24·1	15·8	19·2
1934	24·0	29·3	19·9	24·6	17·7	21·7	14·9	17·1
1938	26·8	34·1	21·3	27·1	20·0	25·5	16·1	18·9

nor the horse stock were reduced in this region to such an extent as in the Great Plain, the drop in the number of the whole livestock did not reach the degree found there. So a characteristic picture emerges here: the density of the livestock rose in Transdanubia and decreased in the Great Hungarian Plain and in the northern areas of the country. The centre of livestock farming was thus transferred to Transdanubia. With this, the phase of development represented by the capitalism advancing in the agriculture of Hungary, and its joining the world market – whereby its agricultural production districts were rearranged – came to an end. This rearrangement further increased the differences long existing between the two sides of the Danube, and made them – especially in the field of livestock farming – even more visible. The differences between the two large regions of the country in the overall situation, and within it in the level of livestock farming, were intensified by the economic crisis.

Thus the density of livestock per unit arable and agricultural area did not considerably change on a national scale, only its proportions shifted, and its distribution among the individual regions of the country became different. In all this, however, only the relation of land and livestock is considered, although we cannot neglect the investigation of another factor: man. As seen before, the population of Hungary increased between 1920 and 1938. Let us see whether the livestock kept pace with its growth (Table 47).

It is only now, in fact, that we can draw up the balance of livestock farming. We can leave out the regional particulars since they would not help us anyway; we have to compare the total population of Hungary with the whole livestock, which shows very disadvantageous features. It is enough to cast a glance at Table 47 to see that the number of animals per 1000 head decreased from 1911 to 1925 at least by 20 per cent. This is in itself a highly unfavourable trend which is even more accentuated by a further 10 per cent decrease between 1925 and 1938 (compared to 1926). Thus, the ratio of livestock to population decreased rather than increased on the new territory of Hungary. No doubt, the quality of the livestock improved, the output slightly increased, and, with the low level of internal consumption, this could temporarily compensate for the reduction in the numbers. But the reduction remained a fact all the same, and characterized the whole situation that livestock farming got into between 1920 and 1938. The numerical stagnation of the livestock, parallel with a slow increase in yields indicated that the de-

Table 47. Number of animals per 1000 inhabitants between 1924 and 1938(3)

Year	Cattle	Horse	Pig	Sheep	Goat	Ass	Mule
1911	282·6	117·9	436·8	313·6	2·7	1·1	0·1
1924	229·1	102·7	297·0	219·2	6·7	0·6	0·2
1925	229·4	104·7	314·6	225·9	7·1	0·6	0·2
1926	218·4	104·6	297·9	213·3	5·8	0·6	0·2
1929	209·9	102·9	298·0	181·5	.	.	.
1934	188·5	90·2	281·2	122·2	.	.	.
1938	207·3	89·6	342·6	179·4	4·6	0·4	0·1

velopment of Hungarian livestock farming which before the First World War had been based on the consumption of Austria and Bohemia belonging to the same union of customs areas as Hungary, slowed down, almost stopped under the influence of the competition of the world market and withdrawal of the protected prices. Loosing the monopolized markets, livestock farming became more extensive, and the composition of the livestock deteriorated. Any export was only made possible by the low domestic consumption.

Notes

(1) On the basis of data of the spring registrations of useful animals. Author's own calculations.
(2) On the basis of data of the spring registrations of useful animals. Author's own calculations.
(3) On the basis of the relevant volumes of "Magyar Statisztikai Évkönyvek" (Hungarian Statistical Year-Books).

Part IV

Chapter 16 General survey of animal breeds

Beyond the number, age, sex, and regional distribution of animals, the value of the livestock is mainly determined by the breeds, their ratio, the conditions (feeding, housing, animal hygiene, utilization) and forms (type of farm, practices, etc.) of management, as well as by the extent and effects of government direction (breeding policy).

The latter – breed, conditions and forms of management, and results of breeding policy – can, in essentials, be amalgamated in the concept of quality, as the quality of livestock is primarily determined by the breed, and the principles of management and breeding.

When evaluating the quality of the livestock the total value of products regularly produced by unit animal (kg live weight) with a unit input (unit area, working hour), the adaptability to new conditions involved with a general development (modernization), as well as the transmittance of these properties are taken into consideration. When looking at it from this point of view, the general statement of agrarian history holds true for Hungarian conditions too, namely, that improvement of quality is one of the oldest, and at the same time most up-to-date objectives of livestock breeding.

So the improvement of quality entails primarily a study of the breeds.

The starting point was a search for the right breeds, since the great diversity of properties shown by the different breeds encouraged the farmers to try to find the breeds most suitable both for the local conditions, and for the given purpose of utilization.

New breeds appeared as a consequence, from time to time. Great hopes were placed in finding the ideal, all-purpose breed. The zeal stimulated by the outstanding results expected from the new breeds was, however, lessened by the fact that the reproduction, and sometimes even the proper acclimatization of the well-proved new breeds took a very long time. However any larger-scale import of replacement livestock met with almost insoluble financial, organizational and management difficulties. That was why breeders chose not the method of pure breeding but the highly efficient and time-saving method of crossing. First they tried to develop the new breeds – chosen earlier rather purposefully – on the spot by the so-called accumulation crossbreeding, by using a few, thus easily and cheaply available sires. The point was that crossing was carried out with the males of locally spread breeds well-proved over several generations, and the new type was to be attained, and its expected properties and productivity evolved in the shortest possible time and highest possible extent partly by creating

new management conditions meeting the requirements of the new breed, partly by selecting and back-crossing the progeny most resembling it.

So the period of searching for new breeds was followed by the phase of crossing. In many cases the latter led to new breeds (types) superior to the original ones, providing thereby a further choice for the widest possible utilization of crossing, and the possibility of an increased chance given by each new combination.

However, the breeders duly realized that the valuable properties of any new and apparently suitable breed had to be maintained. This recognition produced the theory of constancy, the opposite of crossing, whose practical application in Hungary only began in the 18th–19th centuries. In accordance with the new theory the farmers tried to use breeding animals resembling the progenitors, each other, the close relatives and the progeny as much as possible, because in this way the possibility of obtaining a similar progeny was greater. At those times the transmitting ability of animals was thought to be dependent on their pure origin. After the overestimation of crossing this view resulted in the other extreme: pure breeding at all costs. The overestimation of the importance of individuals and progenitors led to a breeding view based on individual potency, which usually took the transmitting ability of the male into consideration. So, breeding by crossing was replaced by a strict pure breeding, and often by inbreeding, interspecific and line breeding, whereby the practice of livestock breeding turned again into a new direction. This fresh view brought about the later often misinterpreted formalism; then the thesis of degeneration led to the antithesis of selection based on production and output – realized in Hungary already at the end of the 18th early 19th century, but only applied in practice in the 20th century.

When surveying the historical preliminaries we have to emphasize that in Hungary the above described periods of development were not a succession of processes taking place proportionately and simultaneously. They only indicate the main phases of development preceding or following one another according to the regional differences or those shown in the pattern of farming.

When looking at the development of Hungarian livestock farming from a bird's-eye view we find a highly conspicuous phenomenon, namely, that the qualitative character of livestock was determined primarily by the breeds (types).

Even in the period discussed the breed was highly appreciated because it was regarded as the carrier of properties useful for practice. Namely, the breeders recognised the possibility of influencing the production capacity of animals – and stocks (called today populations) – through the conditions of management. This produced ultimately the general view – regarded at the same time as the most important result of Hungarian livestock breeding after the First World War – that it was the breed that represented for the farmers the tangible properties. As a result, after the First World War those breeds were mainly sought after which best suited the given conditions and the requirements of production.

Thus, the replacement of breeds was, in essentials, a consequence of the breeder's demand on the usefulness of his animals. The desired type changed according to the changing demand. In the course of this process the properties satisfying the

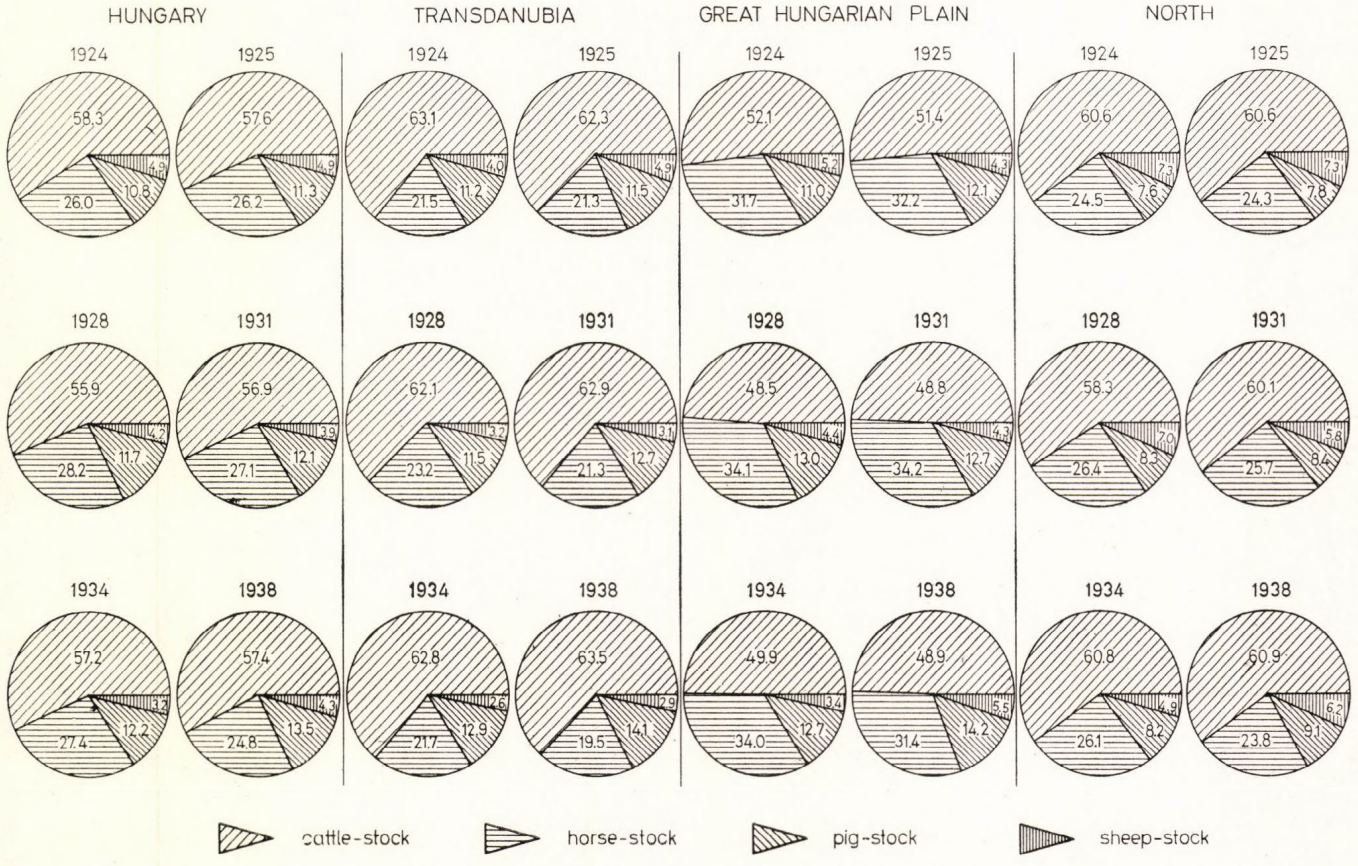


Fig. 32. Distribution of livestock in standard animal. 1924–1938

demands became in time fixed characters of a breed, so the most useful types developed into landraces (local breeds).

This highly natural and accordingly very simple process took place in Hungary at the beginning of the 19th century and can be illustrated by a model consisting of three phases: base, change and stabilization.

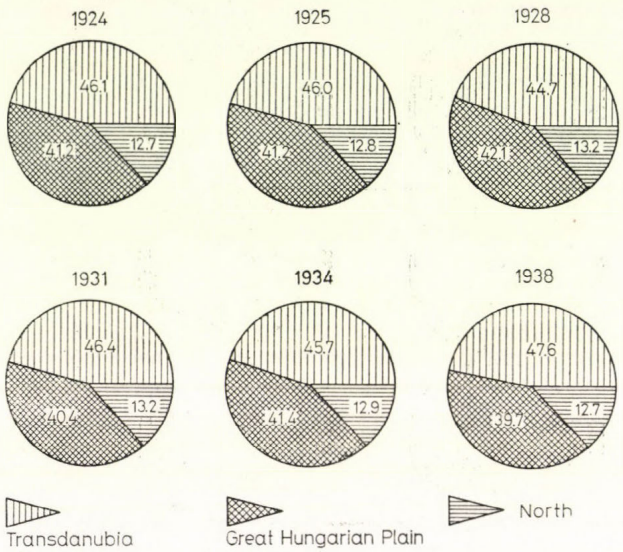


Fig. 33. Distribution of livestock in standard animal among the regions of the country, 1924–1938

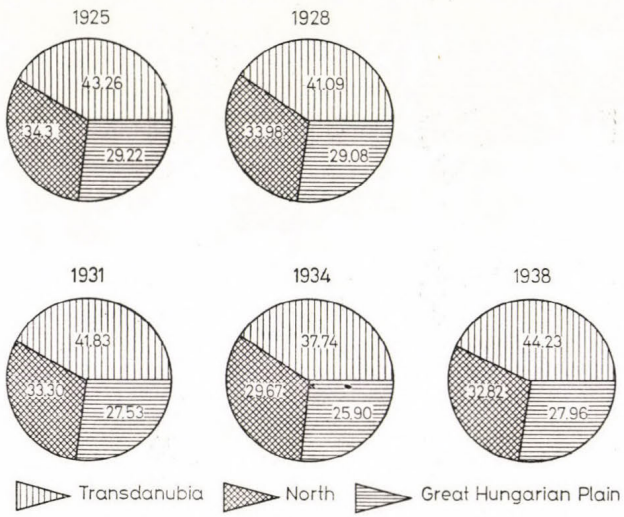
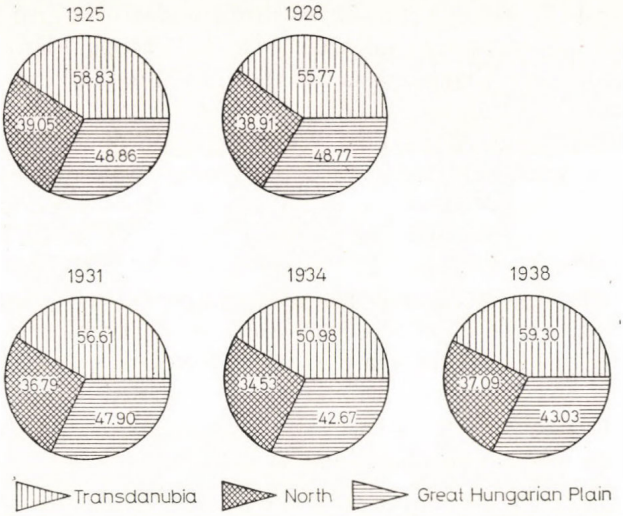


Fig. 34. Standard animal per 100 ha agricultural area, 1924–1938

Fig. 35. Standard animal per 100 ha arable area, 1924–1938



The base was an aggregate of Eastern European lowland breeds living in the closed Carpathian Basin. The change occurred through a mixing of breeds, under the influence of breeds originating from Western Europe, producing a great diversity of animal types and regarded, in fact, as a revolution of breeds. The last phase – if such can be spoken of at all – was the development of up-to-date breeds meeting the new requirements, and characterized by the stabilization of hereditary properties.

Within this threefold model the question of breed in the individual animal species should be examined in the following order: ancient breed, new breeds, and – finally – development of the current Hungarian breeds.

The inter-war period was characterized by the latter, as it was at those times that the Hungarian spotted cattle, the Hungarian combing merino and the Hungarian Yorkshire pig developed.

According to the modern view, priority is given in the order of animal species to the cattle, as the most important ruminant consuming mainly bulk feed. The second in order is evidently the other ruminant reared under similar conditions – sheep. They are followed by the monogastric species consuming mostly grains, in the order of their importance: pig and horse.

Cattle breeding

In a study of the question of breed in the different animal species, cattle breeding is the first to be investigated, since it has always been the back bone of livestock farming in Hungary and so the cattle deserves priority in the question of breed as well.

In Hungary – generally with the badger-coloured breeds in the background – the ancient grey Hungarian wild cattle brought into the Carpathian basin by the conquering Hungarians was the most important breed. Therefore, when analysing the question of breed it is right to take this breed for a basis. However, by the end of the First World War the Simmenthal red-spotted breeds of western origin became dominant, so the changes were represented by them.

The most important change in the inter-war period was undoubtedly the stabilization of the Simmenthal breed, that is, the development of the Hungarian red-spotted – according to current terminology Hungarian spotted* – cattle(1). This excellent breed – due mainly to its properties suiting the new requirements much better than other breeds – became more and more widely known as the representative of qualitative improvement, therefore, in the course of analysing the question of breed, attention will have to be focussed on it.

The grey Hungarian cattle

With respect to the origin and past of the grey Hungarian cattle (*Bos taurus primigenius hortobágyensis* Hankó) it is enough to say here that it was one of the ancient domestic animals of the Hungarian people who immigrated into the Carpathian Basin from their original home in the Urals. The grey Hungarian cattle – earlier called wild cattle – is a Podolian breed of primigenic origin which can be regarded as the immediate successor of the European aurochs *(Bos taurus primigenius)*.

In the 10th and 11th centuries this breed spread mainly in regions suitable for a nomadic life – on flat lowland areas with large thick-grassed pastures and rivers on the Great Plain. The increasing dominance of the grey Hungarian cattle was due to the fact that this breed maximally suited both the requirements of those times and the conditions of the Carpathian Basin. Its capacity as a draught animal, its capability of covering great distances when exported, its toughness, endurance, resistance, vitality, as well as its high quality and tasteful meat which made Hungary the "supplier of Europe in meat", and last but not least its excellent transmitting ability led by the 15th–16th centuries to the exportation of hundreds of thousands of animals of this breed from year to year. Later radical changes in the conditions (caused first by the Turkish wars, then by the decrease and deterioration of natural grasslands, and still later by the consolidation of holdings and separation of pastures, etc.), but mainly the low milking capacity of the grey Hungarian breed limited its further spread. In the middle of the 19th century cattle farming in Hungary – though still based on this breed – showed unmistakable signs of decline. According to contemporary statistics, while in 1884 the grey Hungarian breed made up 80·3 per cent of the total cattle stock of Hungary, by 1895 its proportion dropped to 65·9 per cent, and in 1911 it was only 31·1 per cent.

* The term "Hungarian spotted" means in every case a Simmenthal Hungarian red-spotted breed.

Later, in the inter-war period this ancient Hungarian cattle breed continued to decrease in proportion almost day to day, and in 1938 hardly reached ten per cent of the total cattle stock.

Its decline had hardly any reason other than its having become out-of-date under the conditions of the rapidly developing agricultural production.

It is, therefore, remarkable that the persons competent in this question did not initially recognize the change.

When reading the contemporary papers we find that the authorities gave preference to the grey Hungarian breed over the spotted cattle, so it was the breeders rather than the "supreme authority" who turned toward the western spotted, that is, the Simmenthal cattle. *S. Konkoly Thege* agrees with the opinion that more and more farmers wished to switch over to rearing spotted cattle, owing to the changed economic conditions. This tendency was followed but slowly by government factors, which – though not practically hindering the spread of the spotted breed – were slow in establishing the boundaries of breeding districts and in taking other necessary measures(2).

Later, at the end of the First World War, they realized the situation.

According to "Köztelek", a Hungarian special journal of high reputation and influence, the number of grey Hungarian cattle became ever smaller indicating that the marketing and utilization factors were more important than the emotional motives(3). To cite a contemporary spokesman: "the rearing of the grey Hungarian cattle has come to an end"(4). The change – even if slowly – became apparent in the Great Hungarian Plain too. According to *V. Westsik*, official influence was no longer necessary to persuade the farmers to change over to the rearing of red-spotted cattle, as it was in their own interest to do so(5).

It was very much to the point that a breeder wrote: "It is a fact that the grey Hungarian cattle is tougher, endures the hardships better and even tolerates the bare alkali pastures, but in my opinion, if livestock farming is to be developed we must not put up with the adverse conditions and rear wild cattle suiting them better. On the contrary, we have to change the conditions so as to make a more intensive livestock farming possible"(6).

The reduced number of grey Hungarian cattle and the increasing dominance of spotted breeds of western origin was only a characteristic consequence of the tendency to replace the extensive farming system by intensive forms of management. It was only a natural concomitant of the changed character of livestock management.

It was very interesting that while the spotted breeds spread irresistibly at the expense of the grey Hungarian cattle, certain circles completely disapproved of this trend. Characteristically enough, the National Association of Hungarian Cattle Breeders was only established in 1931(7). When pointing out the gradual decrease in the number of grey Hungarian cattle, the annual report 1934 of the Chamber of Agriculture added that breeders were concerned about it when the importance of draught work with oxen increased again.

At that time the question of draught work was in the centre of interest again,

because – as we shall see later – under the difficult conditions of the economic crisis the cheap work done by draught animals utilizing cheap fodder meant a great advantage compared to the various machines purchased for money and operated with expensive fuel.

Further, the Chamber of Agriculture was greatly concerned in 1934, about the intensive inbreeding carried on in the grey Hungarian herds. For the sake of a higher milk production the population preferred the red-spotted cattle, and the resulting bastards do not exhibit either the toughness of the grey Hungarian breed, or the milking capacity of the red-spotted cattle – the report complains.

The Farm Inspectorate in Hajdú County which had then fifteen "stock herds of fifty" under its supervision, was of the opinion in 1937 that "the grey Hungarian cows owned by the farmers' collective of Hajdúnánás will give such excellent milking results that the grey Hungarian breed will completely eliminate the red-spotted cattle in Hajdúnánás"(8). The objective set in Hajdú County was thus the development and wide propagation of this type.

In the eastern part of the country, the rate at which the western spotted breeds were introduced was quite different. The report of the Farm Inspectorate of Bihar County pointed out that at the beginning of 1936 there was not a single (pure bred) Simmenthal cow in the county(9).

The report of the Chamber of Agriculture proves that attempts to maintain the grey Hungarian breed were continued in the thirties. According to contemporary data in the course of a series of experiments the grey Hungarian cows, when properly fed, produced an average of ten litres of milk a day. There was a cow in first calf at Mezőhegyes which produced 4 200 litres of milk in 365 days, with a 4·9 per cent butterfat content. Among the experimental grey Hungarian cows of the Eger Chapter there was one producing twenty-five litres of milk a day(10). In the dairy farm of the Kapuvár estate the grey Hungarian heifers taken over from the herd and fed intensively produced 14–15 litres a day after the first calving(11).

The "Debrecen, Hortobágy bull-farm", the "Cifre Herd of Hortobágy" and the "stock herd of the town Debrecen" served the purpose of maintaining the grey Hungarian breed. Bull calves born in the two latter were raised on the bull-farm(12).

All this was, howewer, in vain, because thn spread of spotted breeds could not be stopped, and all efforts at maintaining the Hungarian wild cattle were in vain. "The question of breed has been definitely decided", it was pointed out laconically – and rightly – by *P. Bhatta*, who was then official leader of livestock farming in Hungary(13).

Other breeds

Besides the grey Hungarian cattle numerous other breeds existed in Hungary at the time of the change of breeds. Among them the leading role was undoubtedly played by western breeds – mainly Swiss breeds. They will not, however, be dealt

with here in detail, only later, in the chapter discussing the Hungarian spotted breed.

It should be emphasized that in the inter-war period the other breeds were neither national, nor even local breeds and types, but partly the progenies of various crosses, partly the stocks of large estates isolated both from one another and from the common herds. Their total number hardly reached 8–10 per cent of the cattle stock of Hungary.

In connection with these breeds our attention is turned to the badger-coloured cattle in spite of their constantly decreasing number which hardly reached 1–2 per cent of the total stock of the country. Its unimportance was well characterized by the fact that only 30 badger-coloured bulls were used in common breeding by 1938.

Of the less important breeds the Pinzgau breed is worth mentioning, whose influence was felt mainly in the crosses; further, the lowland breeds of various type and colour which were completely excluded from common breeding and were only reared to exploit the locally given possibilities, or for the sake of traditions, or for experimental purposes.

All the other breeds (Shortora, Ayrshire, Freiburg, Karynthia, etc.) were so insignificant as not to deserve being mentioned.

It was an odd phenomenon that there were many larger estates where more than one different cattle breeds were maintained simultaneously. A typical example of this was the largest estate of contemporary Hungary where the following breeds were maintained: Bern, Simmenthal, Hungarian spotted, grey Hungarian, Montafon, Freiburg, Eastfrisian, Rhine, Dutch, and red lowland(14). We have to add, however, that this estate represented almost half of the country, as its parts covered nearly the whole of Transdanubia. Breeding, accordingly, did not serve the same purposes, the local conditions were not the same either, and in several farms large-scale experimentation was carried on.

The Hungarian spotted cattle

The past of the spotted cattle in Hungary is rather varied. The question of breed in the cattle stock of Hungary is highly complex and has not perfectly been clarified even today. Among the conflicting experiences and opinions the most remarkable can be summed up as "the Simmenthal question in Hungary", since the western spotted cattle breeds—even if not always rightly—have been generally called Simmenthal.

In the course of a continuous change of breeds the Swiss red-spotted types gradually became dominant. On the whole the Simmenthal breed stood the test in Hungary, and—capable of adapting itself to changed conditions and new requirements—readily followed the general trend of development. It was, in fact, this up-datedness that was the reason for the success of the Simmenthal breed, and it was on account of this that it played one of the leading roles in the development of the Hungarian spotted cattle.

However, it is not the development, properties, utilization, management and breeding of the Hungarian spotted cattle that have to be discussed when examining the role of the Simmenthal or, in general, of the western spotted cattle. It is more important to mention the breeding conceptions which found this breed, introduced it into the Carpathian Basin, and utilized, reproduced and crossed it according to various types. The key of development is, namely, the right approach, since in livestock farming the maintenance and utilization as well as the breeding efforts are all based on this.

As a first step to changing over to the western dairy cattle, Prince Pál Esterházy imported Swiss cows and organized the first regular Hungarian dairy-farm as early as 1680(15).

The excellent results led to increased interest in the Swiss cattle, and especially in the Fleckvieh reared in Switzerland.

In the development of the Hungarian spotted cattle – earlier called red-spotted –, of the Swiss breeds the black-spotted Freiburg, less favoured in Hungary, the darker red-spotted Bern and the lighter red-spotted Simmenthal played a major role.

In the 1850's all other breeds were pushed into the background by the latter, which with its larger size, more proportionate constitution and resistant organism soon attracted the attention of farmers. At that time Hungarian breeders began to call the Bern type also Simmenthal, partly because this landrace (local breed) seemed to have been highly influenced by the environmental effects of the valley of Simme and its neighbourhood, partly because this type was sought by foreign breeders too, and partly because the Swiss livestock breeding associations themselves set this breed as the target of breeding in 1888.

The "Bern-Simmenthal" question in Hungary can be elucidated by the contemporary opinion in which hardly any distinction should be made between the old Bern and Simmenthal cattle of the early 20th century, as the latter was no other than an improved Bern breed where better feeding and pedigree selection in a certain direction were the means of improvement(16).

According to one of the greatest cattle breeders of the inter-war period the only difference between the Bern and Simmenthal breeds consists – from a Hungarian point of view – of the former's slightly smaller size, slower development, higher endurance and unpretentious character. In *Wellmann*'s opinion the Bern cattle is better draught animal, but inferior in milk production and fattening(17).

The Hungarian type of the Simmenthal breed was made rather uniform in a relatively short time by purposeful breeding and selective work and favourable environmental effects, and finally, due to its advantageous features – especially excellent transmitting ability – widely sought after and reproduced. Contemporary breeders highly appreciated its decisive dominance in the crossings. The development of the Hungarian Simmenthal type followed – though, naturally, with some delay – that of the Swiss type, which only assumed a uniformly fine milking character by the turn of the century, then – with meat production coming into prominence – became a type having massive body. In the inter-war period the Hun-

garian Simmenthal type also became larger, with larger wither-height, more pretentious to feeding, a "fine type and good milker"(18).

However, in the development of the Hungarian spotted cattle not only Simmenthal character, or Swiss breeds, but also other – mainly dairy type – breeds had a share. The introduction of western spotted breeds in Hungarian cattle breeding was the consequence of a general interest shown by farmers towards them under the influence of the changed conditions.

A contemporary expert wrote the following about the western spotted cattle: "there can hardly exist any better known breed in Europe which would not be represented in one or another animal of Hungary"(19).

According to *B. Hankó*, besides the ancient Hungarian cattle breed, at least thirty-one western breeds had a share in developing the present red-spotted cattle to a greater or lesser extent(20).

In his opinion, out of the western spotted breeds the Frisian (first imports: Kajmád 1830, Pálfa 1847, Somogysárd 1863), the Dutch Ijjssesel, Vilstermarsch, Angeln, Shorrtorn (first imports: Zsombolya 1905), Bern (1860, then Ürmény 1812), Simmenthal, Freiburg (Németlad 1838), Swiss brown (Mezőkeszi 1840), Switz, Allgau, Oberinnthal, Murboden, Mürztal (Ercsi 1810), Etschtal, Montafon, Scheinfeld, Kuhland, and Pinzgau breeds were the most important.

The introduction of these breeds was particularly important since they proved advantageous when crossed with the grey Hungarian cattle. In this regard the Swiss breeds were especially outstanding. The special journal "Magyar Gazda" wrote in 1842: "The excellent state of Hunyadi's stock shows that the Swiss cattle is successfully crossed with the Hungarian cattle".

There were thus a lot of western or other spotted cattle in Hungary even from those times when the Simmenthal breed did not even develop in its own country. It was an apt remark that the period between 1820 and 1894 was the time when the Hungarian spotted cattle as a breed appeared through crossing at random(21). *O. Wellmann* also pointed out that it was only in the second half of the 19th century that the attention of Hungarian breeders turned toward the Swiss cattle. At that time the black-spotted Freiburg, and of the red-spotted breeds the Bern cattle were the most famous there. Hungary also imported them. It was not only reared in certain larger estates, but through crossing it was introduced into common breeding too. In the twenties the pure breeding of these types was only carried on by a few large estates(22). Such pure-bred stocks of some fame were then at Kéthely, Sárosd, Németlad, Felsősegesd, Gyulavár, Büdszentmihály, etc. Thus, *Wellmann* does not even mention from that time the Simmenthal, and dates its appearance to the end of the century. According to *Bocsor*, from 1880 Hungarian breeders imported breeding animals from that Simmenthal breed – instead of the old Bern cattle – which made the cattle stock of Switzerland uniform(23).

When examining the import of sires, before the First World War the Simmenthal breed was still far from dominant. So in 1913 besides 114 badger-coloured bulls forty-one, and in 1914 against 110 badger-coloured bulls only seventeen Simmenthal bulls were imported.

The present Hungarian spotted cattle is, in fact, a mergence of the earlier spotted landraces of Hungary, mainly of the Bonyhádi, the red-spotted of Moson-Sopron, the red cattle of Vas County, and of the red-spotted landraces from the region of the river Ipoly and from the Great Hungarian Plain.

Of these the importance of Bonyhádi is generally known. According to *Z. Csukás* this Bonyhádi originated from the following breeds: Franc, Ansbach, Triesdorf, Kimburg, Vogelsberg, Keilheim, Pinzgau, Murna(24). To this basic material first Hungarian wild bulls, later black-spotted Freiburg, then Bern bulls were used, and it was only after 1880 that crossing was performed consistently with Simmenthal bulls. So there is no question of the Simmenthal breed having been some sort of "absolute ruler", just as the other landraces were not, either. In our opinion, the role of the Simmenthal breed – at least in the inter-war period – was, in the light of facts and views of a later time, slightly overestimated.

It is well characterized by the fact that in 1925 a Swiss firm bought in Tolna County a considerable number of Bonyhádi cows and heifers and transported them to Switzerland(25). The fact that he bought cows and heifers indicated that they were breeding animals. If they had been of Simmenthal character, why would these animals have been transported to the country of the Simmenthal breed? Contemporary descriptions and photos clearly show the difference in carriage between the Simmenthal and Bonyhádi breeds, as well as the effect of the Pinzgau not even mentioned so far.

In the south-western counties of Hungary, mainly in Tolna and Baranya, these exaggerated views about the Simmenthal breed were encouraged by the fact that the association organized in Baranya to promote the landrace Bonyhádi (farm inspector I. Mesterovits) changed its name to "Bonyhád-Simmenthal Landrace Breeding Association" (1925). Accordingly, the Farm Inspectorate of Tolna County reported that "the breeding target of the County is the Bonyhád-Simmenthal breed"(26).

Here belongs, further, the complaint of Tolna County (1934) that "the cattle breeding association sticks at all costs to the red-spotted colour-formalism of the Bonyhád landrace, the authorities totally refuse to purchase lighter Swiss or Hungarian full-breed Simmenthal bulls . . ."(27). The cause was that mainly the cherry-red cows were sought after, and better paid. Namely, buyers were of the opinion – confirmed otherwise by a number of estates in the county too – that red-spotted cows produced more milk than lighter coloured ones(28). It is in agreement with the proposal made by *P. Battha*, Agricultural Under-Secretary of State, to organize a breeding stock of such "red" coloured cows and reproduce this "dense cherry-red spotted" cattle (1941).

According to contemporary descriptions the live weight of Bonyhád cows was 500–550 kg, their wither sheight an average of 134 cm. The length of the back was 119, and the chest circumference 140 per cent of the withers height. The spots were often of bright and dark red colour, their size was in many cases similar to that in the Bern breed, with jagged edges. It differed from the full-bred Simmenthal by its finer bones, slow development and smaller body conformation. Though

three-purpose, its most important feature was its high milk production ranging at that time between 2 000 and 2 500 litres, with a 4 per cent butterfat content.

Later the Bonyhád landrace did not develop at such a rate as rightly expected, since owing to the shortage of grazing land cows of this type generally were stabled all round the year, that is maintained under unnatural conditions which later brought its own repercussion(29). In spite of this, at the beginning the Farm Inspectorate of Baranya County reported the following: "where common pastures are not found, or where the cattle is stabled, the stock is excellent concerning both general conformation and milk production . . . where, on the other hand, there are large common pastures, the cattle stock is of lower value, because farmers do not take care of the feeding"(30).

The stabilization of the Bonyhádi landrace was prevented also by the fact that a large number of cows were maintained in milking farms, where they finally were slaughtered. Those competent in this question protested against it already in 1927(31).

In the development and spread of the Hungarian red-spotted type the most important role was undoubtedly played by the Bonyhádi landrace. Its great value, which became famous in a relatively short time all over the country, was probably due to the fortunate and hereditary combination of the excellent digestive organs (feed conversion) of the grey Hungarian wild cattle, and the first-rate lactific organs (udder) of the Bern, Freiburg, Simmenthal, etc. cows, and perhaps the heterosis effect (hybrid vigour) of the distant primigenic blood had a part in it too.

We have to mention separately the red-spotted landrace of Moson-Sopron, which for several decades was the object of investigation made by *I. Ujhelyi* in the framework of the Magyaróvár Cattle Breeding Associations organized in 1896. According to the annual report 1912–1913 of the Milking Control Association of Sopron County, the milk production of the nearly 1 000 cows was at that time already 3 285 kg a year, with a butterfat content of 3·66 per cent.

The red landrace of Vas county, and the red-spotted cattle reared along the river Ipoly and in Pozsony and Nyitra Counties were originally of spotted character, even the red-spotted lowland type developed in the environment of the grey Hungarian breed was like that.

Z. Csukás decidedly was of the opinion that all of the mentioned landraces had existed in some or other form in the country before the Simmenthal was imported. Later on, however, – he says – the breeders and the persons directing the breeding activity gave a perfectly Simmenthal character to the Hungarian spotted cattle, so the latter could not be distinguished from the full-bred Simmenthal(32).

The Hungarian landraces merging into the Hungarian spotted breed, though actually of brachyceros and primigenic origin, were thus one and all of western spotted character already when the Simmenthal bulls were institutionally and generally introduced. It should be kept in mind that the frontosus Simmenthal too has brachyceros in itself!

The developing Hungarian spotted breed – earlier called red-spotted – gained a final – mainly morphological – uniformity due to the Simmenthal blood. This was the reason why the leading role was attributed, after all, to the Simmenthal breed.

The success of the Simmenthal breed was due to the following:

– through its excellent transmitting ability it was able to produce efficiently and rapidly rather uniform progenies having more favourable properties than the former breeds;
– as a mountain breed, it was easy to acclimatize;
– as a three-purpose animal it raised interest in wide circles;
– it was especially responsive to intensive management methods;
– its spread was promoted later on by the state too;
– farmers gave high preference to its breeding, since young Simmenthal bulls could be sold as sires easily and at a considerable price.

All this led ultimately to a sort of Simmenthal cult, so the effects of this breed were increasingly felt.

The predominance of the Simmenthal breed was, however, realized rather early.

It was in the first place *S. Konkoly-Thege* who already in 1921 – when a committee consisting of *J. Békessy*, *A. Leidenfrost* and *L. Vass* imported 150 young bulls for service from the famous bull-show in Bern-Ostermundingen – wrote that the material deteriorated to some extent even in Switzerland. The number of high-legged bulls was remarkably large, many of them looked like becoming not long enough, and there was a relatively high number of female animals too . . .(33). Later he distinctly stated that several years of interruption in the imports of Swiss breeding animals would not adversely affect the level and development of Simmenthal breeding in Hungary(34). Otherwise he disapproved – even in Germany – of the Swiss going too far in increasing the height and body size of Simmenthal cattle(35).

Wellmann and *Horn* also gave a warning. The former pointed out that in the future Hungary would have to be cut off from the imports(36). And the latter called attention to the fact that in a full-bred Simmenthal stock besides high lactation capacity individuals and lines there were cows of very poor milk production(37). Horn was very determined, anyway, in his opinion that the full-bred Simmenthal cattle representing no economic value had to be sorted out with the same rigorousness as the animals objectionable from other breeding or economic aspects. He believed it highly incorrect to overestimate animals for the only reason that they were full-bred while their economic value was reduced, and to promote the spread of such lines. In his opinion it was a mistake to saturate the original grey Hungarian stock – having economic properties much more valuable in many respects than full-bred cattle – with Simmenthal blood(38).

Wellmann inveighed against the mass import of Swiss bulls selected without sufficient care as early as in 1922(39).

P. Battha too was of the opinion that the import of Swiss breeding material had to be restricted to well-founded cases(40).

There were some well-known breeders who also disapproved of the excessive propagation of the Simmenthal breed having become fashionable anyway(41).

The Simmenthal breed aroused aversion and sometimes even antipathy mainly because it failed to fulfil the expectations as to its milking capacity.

G. Lüthy, Managing Director of the Swiss Livestock Breeders' Association (Bern-Muri) believed that Swiss Simmenthal cows even increased their milk production when transferred to a country with management conditions equal or similar to those in Switzerland. In his opinion that was the reason why the Simmenthal breed had so many friends in Hungary too(42).

As opposed to this opinion undoubtedly formed in good faith we have to point out that the very reason why the Simmenthal cows failed to achieve total success in Hungary was that in wide practice they were inferior in milking capacity to other western spotted breeds, the Hungarian landraces and the badger-coloured cows alike.

All troubles originated from the unfortunate view that "even a poorer quality Swiss bull produces higher results when introduced into a Hungarian breeding stock than any higher-class Hungarian bull". This was said in a lecture delivered by *J. Békessy*, the renowned Hungarian expert on this question, at the National Association of Hungarian Farms on 9th October 1933(43).

Later even the Swiss realized that breeding sires exclusively for exterior was not right, and soon changed over to the "Wirtschaftstyp". Unfortunately, in Hungary the old—and otherwise highly profitable—breeding objective of obtaining male progenies showing the best possible body conformation was pursued for a too long time. The fetishism of breeder bulls pushed the requirements of feed conversion, milk production, etc. into the background.

Horn was perfectly right in pointing out that the principal aim of maintaining full-bred cows was to raise bulls, and disapproved of the increased significance cows of little value had on account of the mere chance of producing the highest number of breeder bulls, while at the same time they reproduced blood-lines of low economic value. Otherwise it was this tendency that urged the breeders to increase imports. It was a way of producing more "full-blooded" bulls, and the aim could be attained sooner in this way. It was aptly pointed out by *Horn*: "When the Hungarian farmer considers the body conformation of the full-blood Swiss Simmenthal cattle to be the target of breeding, he tries to obtain a type whose maintenance can only be ensured by continuous imports"(44).

However desirable it would be to follow the development of breeds influenced by the Simmenthal breed by supporting it with concrete statistical data from the inter-war period this is precluded by the unreliability of data collection. How were we able to find out whether the animals classified into the different categories of breed mostly by incompetent persons really belonged there? This particularly holds true of the large number of various bastards making up the bulk of the cattle stock in Hungary, which were placed in one or another group at random.

Of course, some picture can undoubtedly be obtained from these statistics, the most reliable of which from this point of view is the detailed statistical survey of farms in 1935 showing the following distribution of breeds in per cent:

grey Hungarian lowland	14·6
Simmenthal	6·8
other red-spotted	73·6
other western	1·1
other	3·6
buffalo	0·3

According to the most important and at the same time most characteristic data the Simmenthal and Simmenthal character cattle only made up 8·31 per cent of the spotted character cattle stock of Hungary (129 919 Simmenthal + 1 412 622 other red-spotted + 20 633 other western breeds).

The changes of breeds can be much better followed by surveying the stock of cattle shows. These statistics – though not representing the overall situation of the country – are highly characteristic of the future trend of breeding, and perfectly reliable as to the identity of breeds.

These data are especially interesting because they show that even at these cattle shows reflecting the general tendency of development and the objectives of the agricultural policy of the government the Hungarian red-spotted cattle was found in the largest number, and from 1927 on – except the years between 1931 and 1934 – its proportion always was higher than that of the Simmenthal cattle.

A further point of interest was that the designation "Bern" was no more mentioned after 1926 indicating that this breed merged into the other breeds.

But what arouses the breeders' interest most is how the name of the group consisting in essentials of Hungarian spotted cattle changed from year to year well characterizing the evolution of the breed:

1922 – "Hungarian Simmenthal – of Bern character",
1923 – "cross of Hungarian red-spotted and high-blood Simmenthal",
1924 – "red-spotted Hungarian",
1925 – "Hungarian red-spotted",
1926 – "Hungarian red-spotted landrace",
1927 – "Hungarian red-spotted",
1928 – "high-blood Simmenthal, Simmenthal half-bred, Simmenthal character and Hungarian red-spotted",
1929 – "Hungarian red-spotted",
from 1930 – "half-bred Simmenthal and Hungarian red-spotted",
from 1940 – "Hungarian spotted"(45).

We have to note here that from 1939, in the group of "Simmenthal spotted cattle", "full-blood Simmenthal", "Simmenthal" and "Hungarian spotted" cattle were distinguished in Hungary.

Animals originating both on the mother's and father's side exlusively from Swiss red-spotted cattle were qualified as full-blood Simmenthal.

Animals whose origin could not reliably be traced back to full-blood Simmenthal cattle, but their cow ancestors had been mated at least four times with full-blooded or six times with Simmenthal bulls were called Simmenthal. This provided a possibility of requalifying the progenies of a Hungarian cow as Simmenthal after the above mentioned process of breeding. All this did not, however, mean that a non-full-blood stock could ever become full-blooded.

Finally, the name "Hungarian spotted" was assigned to animals which, though they did not meet the above requirement, were of Simmenthal character(46).

In connection with the above *Horn* pointed to the fact that the value of a breed could only be maintained by a constant selection, and if this was neglected the progenies – while remaining of full-blooded Simmenthal origin – would change in exterior, inner value and hereditary material and no longer represent the economic value originally attributed to them.

To sum it up, we must admit the highly important – though not at all exclusive – role of the Swiss Simmenthal breed in developing the Hungarian spotted breed. Its significance, just like its favourable effect – beside all the negative features – is beyond question.

According to competent opinions, in spite of the fact that most breeders of the Hungarian spotted breed set the aim of attaining a cattle stock possibly identical but at least very similar to the Simmenthal breed both in colour and in conformation, this tendency was not in every respect good for the properties of the developing Hungarian spotted breed. The Simmenthal breed, though it increased the body size, the carcase, and undoubtedly had a favourable effect on shape, increased, at the same time, the exacting character of the cattle stock as well, and very often under the influence of unfavourable management conditions produced large-framed, high-legged, flat animals of low productivity and insufficient resistance. Its greatest disadvantage was, however, that the milking capacity of the original Swiss cattle did not satisfy the Hungarian requirements, and so the excessive spread of the Simmenthal breed did not improve the milk production of the Hungarian red-spotted stock; in certain regions even had an adverse effect on it(47).

Development of breeds

When examining the question of breed in the cattle stock of Hungary in the inter-war period we are surprised to find quite diverging views – especially at the beginning of the period – in spite of the rather uniform tendency of development determined by practical life.

There were many who fought for the grey Hungarian breed. Others regarded the Simmenthal as the only suitable breed. Some were convinced of the badger-coloured cattle, while others were all for the lowland breeds.

I. Ujhelyi, one of the best known cattle breeders of great prestige in the period,

editor of the Hungarian National Farming Association's bulletin, did not much appreciate the Simmenthal imports, and thought the Swiss cows imported by Moson County in 1914 to be much inferior in milk production to cows registered in Hungary and bred for milk production(48). *Ujhelyi* recommended the import of Frisian and Danish breeds and added that he did not think it advisable to keep different breeds in common breeding. In his opinion the large estates ought to have been forced to comply with the tendency of common breeding. Otherwise, he himself recommended the Simmenthal breed to Transdanubia, since these animals being larger than the badger-coloured cattle could have improved the meat supply(49).

The Ministry of Agriculture could not decide on the question of breed; whether or not to keep to the well-proved Simmenthal character red-spotted breed; while as regards the breeding, districts diverged temporarily from the instructions followed in the past, and allowed the rearing of other (Holland, Frisian, or possibly Danish) cattle besides the one prescribed(50).

The general uncertainty was characterized by the fact that no decided official stand or measure was taken on the question of breed. The relevant decisions and laws (1880, 1894) did not say much either beyond establishing that the continental climate and the extensive conditions suited the grey Hungarian breed, the capital and its environs called for the lowland breed while the other regions required the badger-coloured breed. At that time not a word was still spoken of the red-spotted cattle in common breeding. Any definite stand was only taken in the case of the grey Hungarian cattle to which mainly the Great Hungarian Plain, the eastern parts of contemporary Hungary, and Eastern Transdanubia were assigned as breeding regions (1880). In the absence of definite general instructions the counties attempted to solve the problem of breeds through local regulations(51).

According to the statute XII. 1894: "Transdanubia and the left side of the Danube forming the smaller half of the country are under the influence of the frontosus blood, except the northern mountain area where the Pinzgau breed is predominant. However, the largest breeding districts of the latter are, in fact, the southern and south-eastern borders of the country, from Krassó-Szörény to Brassó County. The badger-coloured breed, however, is reared in all mountains of Máramaros, Ugocsa, Bereg and Ung Counties, from the northern border of Beszterce-Naszód. The larger half of the country left over the mentioned regions, forms the breeding area of the Hungarian cattle"(52).

Measures taken in the inter-war period which were proposals rather than instructions, did not much promote the final solution of this problem either.

Thus, the mentioned "uncertainty" left, in fact, all doors open with absolute certainty, and left it to practice to arrange the regional distribution, spreading and development of the type of the individual breeds.

After all this, the question arises that, if the more intensive system of farming involved replacement of the grey Hungarian cattle by breeds of western origin, why the spotted and not the similarly intensive badger-coloured cattle came into prominence, and – if in the competition the former won – why the Simmenthal

breed assumed the lead in this transformation upsetting the cattle breeding of Hungary, and radically changing its whole nature.

The first question can be answered with the words of *O. Wellmann* who carried out thorough investigations into this problem. In the opinion of this prominent cattle breeder of those days the meat production of the red-spotted cattle is superior to that of the badger-coloured breed, since the former has a larger live weight, and a more intensive and long-continued growth vigour. The red-spotted cattle exhibits a somewhat better feed conversion during the period of fattening, and attains a higher weight gain than the badger-coloured breed. Merchants were more willing to buy red-spotted fatted oxen and paid a higher price for them than for badger-coloured ones, supposedly because the former had a more attractive meat of a lighter colour. Accordingly, as regards the utilization of meat the Simmenthal cattle was superior to the badger-coloured one.

According to *Wellmann* there were no such differences in draught capacity between the spotted and badger-coloured oxen; e.g. in the Sárvár estate the badger-coloured oxen were preferred because of their toughness, and because owing to a higher resistance of the hoof horn diseases of feet were fewer with them.

From the aspect of milk production *Wellmann* suggested that preference had to be given to the badger-coloured cattle, since they were fully bred homogeneous animals requiring less feed for the production of a given amount of milk than red-spotted cows. This can be explained – in his opinion – by the fact that the butter-fat content of milk is lower – only 3·5–3·6 per cent – in the badger-coloured breed(53).

Wellmann's reasoning does not, however, give a satisfactory answer to the question. Neither is his opinion convincing enough, and gives the impression as if he had felt secretly drawn toward the badger-coloured breed. It is all very easy to understand knowing the results of the Montafon cow-farm at Felsőszászberek rather well(54). Furthermore, it must be emphasized that the badger-coloured breed when crossed with grey Hungarian cattle produced excellent bastards well-proved particularly as draught oxen in practice. All this was confirmed by systematic experiments carried out in the dairy-farm of a peat factory of the Esterházy Princely Estate Tail in Sopron County. It must be added that in this case the bastard cows of badger-coloured × grey Hungarian cattle were also satisfactory.

In lack of other data a characteristic picture is given of the milking capacity of dairy type breeds at that time (1922) by the Milk Production Controlling Association of Fejér County(55). Accordingly the annual milk production of the

Simmenthal breed was	1 593 kg	with 4·02% butterfat
Hungarian red-spotted was	1 665 kg	with 4·10% butterfat
Montafon was	2 400 kg	with 3·58% butterfat
other badger-coloured was	1 842 kg	with 3·67% butterfat
lowland breeds was	2 238 kg	with 3·84% butterfat

Subsequent changes in the cow-farms kept under control are shown in Table 48(56).

Table 48.

Year	Full-bred Simmenthal		Simmenthal		Hungarian red-spotted		Badger-coloured	
	milk kg	butterfat %	milk kg	butterfat %	milk kg	butterfat %	milk kg	butterfat %
Large estates								
1930–1931	3 689	3·7	3 788	3·7	3 499	3·7	3 833	3·7
1931–1932	3 817	3·8	3 658	3·8	3 384	3·7	3 769	3·7
1932–1933	3 693	3·7	4 129	3·6	3 580	3·7	3 748	3·7
1933–1934	3 456	3·7	4 027	3·6	3 608	3·7	3 393	3·6
1934–1935	3 341	3·7	3 682	3·7	3 397	3·7	3 224	3·5
Small farms	Full-bred Simmenthal				Simmenthal			
1930–1931	2 801	3·8			2 721	3·8	—	
1931–1932	2 538	3,8			2 500	3·8	—	
1932–1933	2 866	3·8			2 892	3·8	—	
1933–1934	2 839	3·8			2 825	3·8	—	
1934–1935	2 537	3·9			2 705	3·7	—	

We have to add to this table that the Simmenthal cattle – especially full-bred animals – were much better fed and usually maintained under more favourable conditions, than the Hungarian red-spotted cattle. The picture outlined by the data should accordingly be considered to have been distorted in favour of the Simmenthal breed.

So the badger-coloured breed was by no means inferior in milk production – in spite of a lower butterfat content.

O. Wellmann himself modified later his above cited opinion by writing that the badger-coloured breed was in more than one respect superior to the Simmenthal. In his opinion their advantages included an unpretentious character, good beef capacity and low feed consumption per unit milk quantity produced. He thought that the greatest importance of their breeding lay in the possibility of supplying the Balkan countries with breeder bulls. He welcomed the decision of the government that a breeding district of badger-coloured cattle was to be established in the north-eastern part of Hungary(57).

This was soon realized: the Ministry of Agriculture organized badger-coloured breeding districts in the mountain villages of the counties Gömör, Kishont, Abaúj-Torna and Zemplén.*

S. Konkoly-Thege himself admitted that it would have been more advisable to make use of the smaller size less demanding badger-coloured breed instead of importing western cattle when changing over to higher utilization breeds, as the badger-coloured cattle was closer to the ancient Hungarian breed both in colour and character. In his opinion this would have been advantageous if only because

* The present territory of Slovakia.

in the countries east and south of Hungary – with the exception of minor isolated areas – small-bodied, uniform-coloured animals more like the badger-coloured breed were raised. He added that this thought and desire came too late and cattle breeding in Hungary had to hold to the generally well-proved breed of spotted cattle(58).

It must be noted here that the badger-coloured cattle was earlier registered in the same herd-book as the spotted cattle, and it was only during the Second World War that a separate organization: the "National Association of Badger-Coloured Cattle Breeders" functioned(59).

The decline of the badger-coloured breed has not been sufficiently explained by the analyses made so far. The causes must be looked for elsewhere. I think I am not quite wrong in finding the causes partly in the situation created by the Peace Treaty of Trianon, partly in the fashion influencing the tendency of breeding, and partly in the smaller body weight and body measurement the badger-coloured cattle.

With the new frontiers drawn by the Peace Treaty of Trianon the breeding area of the badger-coloured breed was, in essentials, annexed to the successor states, and only the border areas with isolated large estate stocks were left to the new territory of Hungary. The situation changed thus to the disadvantage of the badger-coloured breed.

The so far uniform tendency of livestock maintenance and breeding in the Carpathian Basin was upset after the First World War. The new tendencies roughly polarized the cattle breeds too. On the new territory of Hungary the western spotted and the grey Hungarian cattle were dominant, and somewhat later (1939) – according to competent sources – 82 per cent of the cattle stock of the country consisted of multi-purpose, Simmenthal type Hungarian landraces(60).

The natural adaptation to the given conditions was greatly promoted by the fact that the spotted breeds were the most easily available, and even the government encouraged already their propagation.

Another factor that fundamentally influenced the tendency of breeding was fashion. It was fashion that helped the Simmenthal type to become predominant. So the badger-coloured breed was automatically pushed into the background.

The third factor which – though seemingly unimportant – gives the most obvious explanation is the fact that the badger-coloured cattle is of much smaller body than the Swiss spotted cattle.

Hungarian breeders preferred large-bodied animals. This preference too contributed to drawing the farmers' attention from the small-bodied badger-coloured breed and turning it toward the large-framed spotted cattle mainly of Swiss origin.

Knowing the above we need no further explanation of the decreased importance attached to the badger-coloured breed. It remains to be answered, however, why it was the Simmenthal of all western spotted breeds that became dominant in developing the Hungarian spotted breed.

Before the First World War cattle breeds were reared in the Carpathian

Basin in a diversity hardly believable today. Repeated surveys have identified so far more than 60 breeds, landraces, bastards and types(61).

Thus, in the cattle breeds developed in Hungary—irrespective of how they were called—"blood circulated" from a large number of breeds, so—except the pure-bred stocks—not only the ancient primigenius but also the brachyceros and frontosus backgrounds must by all means be taken into account. In my opinion at the time of the nation-wide competition of breeds the cattle stock of the country consisted already mostly of crossed animals.

Thus, the question had better be put in the following way: if not the badger-coloured, why was not the Pinzgau widely reared and spread in its bastards, or the lowland breeds that came into prominence?

This simplification of the question was encouraged by *O. Wellmann* who summarized the enumeration of the most important western cattle breeds introduced into Hungary by saying that the Swiss red-spotted, the badger-coloured, the Pinzgau and in the large estates the lowland cattle were the most significant among the large number of cattle breeds imported from western countries.

When speaking of the Pinzgau breed we have to note that this breed spread to a much greater extent than we should think today, not only in Transylvania but in other places as well. Its greatest advantages were its easy utilization and high capability of development. It was not too pretentious, was a good milker and gave excellent draught oxen. According to the statute XII. 1894, the "Pinzgau predominated" on the northern mountain areas, but was rather wide-spread in the southern and south-eastern parts of the country too. In 1891–1892 alone more than 400 Pinzgau cattle were imported(62). When a child I myself saw many Pinzgau bastards in the peasant farms in a large part of Transdanubia. In the successor states of the former Monarchy (Czechoslovakia, Romania, Yugoslavia) a relatively large number of Pinzgau cattle or its crosses are maintained even today.

However important the role of this breed was in the historical Hungary, the most important Pinzgau districts were disannexed from Hungary by the Peace Treaty of Trianon, and this breed was pushed into the background partly by the same causes as mentioned in the case of the badger-coloured breed, partly by the fact formulated by *O. Wellmann* as follows: it could not compete with the Simmenthal cattle either in milk production or fattening(63). Nevertheless, we have to note here—with *Wellmann*'s words again—, that even if the Pinzgau blood lost much of its former importance, in landraces originating from popular breeding the white stripe running along the spine, the colouring maybe fascia on the lower part of the legs suggested the presence of some Pinzgau blood, acknowledging thereby the role of this breed in the development of Hungarian landraces(64).

The lowland breeds still encountered were raised almost exclusively in dairy-farms of large estates isolated from each other, so the possibility of their spreading was reduced to a minimum. According to *Wellmann*, who compared the breeds, the lowland cattle was superior in milk production to other breeds, because it yielded more—though lower quality—milk, than Simmenthal cows, however,

as a beef cattle and draught animal could not compete with the Simmenthal type cattle. In addition, these breeds were susceptible to tuberculosis(65).

G. Bocsor is of the same opinion. He thought the milk-type lowland cattle (Holland, Eastern-Friesland, Wilstermarsch) were less suitable for fattening, besides being inferior as draught animals; neither they nor their crosses endured well the continental climate of Hungary, and under the poor feeding conditions of those times did not fulfil the expectations concerning their milk production either(66).

These circumstances satisfactorily explain why the Simmenthal became the dominant western breed in Hungary. However, the question of how much the Simmenthal contributed to the evolution of the Hungarian spotted breeds remains.

Without the influence of the Simmenthal breed the development of the Hungarian spotted cattle would undoubtedly have taken a different course. If there had been occasional intervals in the Simmenthal import, the Hungarian spotted types – especially the Bonyhádi landrace –, that produced more milk than the Simmenthal, would have come into prominence which would have done good to Hungarian cattle breeding as a whole. However, I am of the opinion that the Simmenthal cattle – while undoubtedly playing a leading role – was far from being the only factor in developing the Hungarian spotted breed, as the latter was actually formed from a mergence of the earlier spotted landraces.

Sheep breeding

After the cattle the other ruminant species, the sheep, will be discussed, because the changes in its breeds were closely connected with those in the cattle breeds, and because it provides an opportunity for disclosing very interesting analogues and antagonisms.

In the inter-war period the most important change in sheep breeding undoubtedly occurred under the influence of the merino breeds which transformed the Hungarian combing merino into a uniform breed and pushed the other sheep breeds finally into the background.

The Hungarian "racka" sheep

While in cattle breeding the grey Hungarian breed provided the basis, in sheep breeding this place was occupied by the racka breed *(Ovis aries strepsiceros hortobagyensis)*.

This ancient, typically Hungarian animal breed originating from the hilly region of the Volga–Kama crook does not occur anywhere in the world but in places where Hungarian people live and lived, and with its uniquely erect and twisted horns can be easily distinguished from all other sheep breeds. The occurrence of these twisted horns in flocks existing today marks with absolute certainty the

places and pathways called "original home" and "migration ways" by the science of history(67).

Thus, the Hungarian racka sheep came into the Carpathian Basin with the first Magyar settlers of Hungary and played a leading role in Hungarian sheep breeding over long centuries(68).

By the time of the two world wars it became, however, out-of-date and was gradually pushed into the background. Its black-and-white types were mainly maintained in the Great Hungarian Plain.

Comparing the sheep and the cattle on the question of breed we find a certain analogy, namely, the ancient Hungarian breeds: the grey Hungarian cattle and the racka sheep disappeared roughly at the same time, leaving behind hardly more than what remained in their crosses and in a few reservations. According to a contemporary opinion there is hardly any country in the world which has changed its domestic animals so radically as Hungary did(69). In 1925 on the pastures of Hortobágy – the part of Hungary after which the racka sheep was named – the total number of sheep was 23 514 of which 21 687 were merino and only 1 827 racka(70).

While the merino type sheep generally was maintained by large estates, the racka lived almost exclusively on peasant farms.

According to the description of the breed its most characteristic feature was the corkscrew-like horns of both ram and ewe which grew in V-shape straight upwards out of the coronal bone. The unconditionally hereditary twisted horn characteristic of the breed can be found in no other sheep breed. The axes of the horns enclose an angle of 90–100 degrees with rams, and 50–60 degrees with ewes. The slightly projecting straight horns are 50 cm long on rams and 30–40 cm long on ewes. As to the position of its horns this breed differs from all other breeds, even from the other racka breeds (Transylvanian racka, Hungarian-Moldavian racka), since in the latter breeds the rams have slightly twisted horns curling spirally in smaller and smaller circles to end in a tip, while the horns of the ewes are quite stunted, short and flat. In these breeds we often find hornless ewes.

The Hortobágy racka is relatively large. The height of withers is 70–75 cm in the ewe, and even more in the ram. This great difference is just as characteristic of the breed as the body length always exceeding the height of the withers and even that of the hindquarters which usually is 2–3 cm higher than the height of withers. Compared to other sheep this breed is relatively long-legged, a reminiscence of the nomadic life. The skull is broad, the facial part narrowing, so the head has a fine shape. It holds its head high. The profile is straight; the outer ears are thin and horizontal and only raised when watching. The eyes are lively, the look shows alertness. The body has an attractive regular shape, with a primitive character. The back is narrow, sharp, the breast deep, flat, the muscles are lean, the tendons hard as steel, the bones thin but strong. The legs are of regular set. Its movements are agile, light, its temperament is lively, its gait stately. It is more like the wild sheep or chamois than the domesticated sheep breeds. Its fleece consists of coarse upper hairs and finer fluffs. Among the latter there are staples as thin

as 1/200 000 mm. Its fleece is tufted, the length of the tufts is 25–30 cm. The animals are either black or white. The head and legs of the black animals are covered by smooth, short, shiny, permanently black hairs. The fleece is black turning later – with the appearance of white hairs – into grey. The head and legs of the white animals are brown, yellowish brown, yellowish white, and very seldom white. The fleece of the white racka is always white.

Its milk production is rather considerable, ranging from 50 to 80 litres per ewe. Good milkers are, naturally, able to produce 150–200 litres or even more milk during a lactation period. Its meat production, on the other hand, is of minor importance, since its muscles are lean, hard. In fertility it is inferior to the combing merino. Its development is slow, reaching maturity when 1·5–2·5 years old. It is the least demanding on grazing, feeding and housing of all breeds in Hungary. It is a hardy breed, precipitation runs off its tufts, so it can stand steady rain and snowfall well(71).

Other breeds

Besides the Hungarian racka(72) forming the basis of sheep farming in Hungary a large number of other breeds were also encountered at the time when the great change of breeds took place. Among these breeds the leading role was undoubtedly played by the fine-wooled merino. This breed and the variations and types belonging here will be discussed later on, in the chapter dealing with the development of the Hungarian combing merino.

Thus, in this place only the major non-merino breeds raised in Hungary in the inter-war period will be discussed.

According to the general opinion, in the period preceding the First World War besides various merino breeds only English meat-type sheep, Frisian, karakul, cigája and racka sheep were reared in Hungary in any considerable number(73).

On the whole, this was the situation in post-war Hungary too with the difference that beside the merino all other breeds lost significance. The "cikta", the "Zaupelschaf" origin Swabian sheep of Tolna and Baranya Counties is hardly worth mentioning, since this rapidly degenerating breed having become out-of-date in a very short time did not even take part in the evolution of the Hungarian combing merino. From this point of view the English meat-type sheep and the karakul were also of little importance. In the mid-twenties only one flock of the former breed (Elek's flock at Hippolit) and two of the latter (Nagycenk sugar factory, Alsóság; Wimpffen's, Anasztázia) were known. In the inter-war period the cigája stock was reduced to an insignificant number, and was confined to the southern half of the present Pest and Bács-Kiskun Counties and to Békés County, where they were maintained – in gradually decreasing numbers – mainly by the peasantry. The few minor flocks – or rather sheep – scattered in Baranya County hardly deserve mentioning. Although the cigája breed later merged in the group of merinos, their former existence is only indicated by small black spots.

The other sheep breeds (Ile de France, Württemberg, East-Frisian, the above mentioned karakul, down, etc.) reared in Hungary in the inter-war period were not of much importance. Yet, we should like to say as much that the Frisian sheep was reared in pure-blood by the Royal Hungarian Agricultural School at Kecskemét(74).

The Hungarian combing merino

While in the cattle branch the appearance of western spotted breeds (Bern, Simmenthal, etc.) was the result of intensified agricultural production, in sheep farming similarly western merino breeds (electoral-negretti, Rambouillet, etc.) were introduced following a demand arising for finer wools.

The spread of new breeds was in both cases greatly promoted by the general progress, and especially by the advances made in the industry. In cattle breeding the great change of breeds was a result of the rapid technical development of the dairy industry (skimming machine, 1875), in sheep breeding it was brought about by the revolutionary modernization of the textile industry requiring an ever increasing quantity of finer wool (power-loom, 1785).

It is highly interesting that the first Swiss spotted cattle (1680) and the first "silky", merino, fine-wooled Padovan sheep (the cloth factory at Gomba was established in 1666) were imported approximately at the same time.

The Padova sheep *(Ovis catotis paduana)* just mentioned was said to be a hybrid of the Bergamo breed and various Spanish breeds; it was imported from Italy, first by Archbishop G. Szelepcsényi and Prince Eugene of Savoya(75). The first "true" merino sheep is commonly believed to have been imported by Queen Maria Theresa from Spain (1773), though such fine-wooled, Spanish origin, merino sheep had even earlier been introduced into Hungary in fairly large numbers(76).

The origin of the name "merino" has not been perfectly clarified. Perhaps it comes from the word "Moor" (curly) or "transmarinus" (overseas), but it may have happened that the name of Spanish judges deciding in lawsuits of shepherds was transferred to the sheep representing the subject of litigation. According to *G. Császár* "merino" is a Spanish word meaning "migrant": Ovejas merinos = migrating sheep(77).

In Hungary first the overbred, small-bodied, thin-wooled electoral (escurial) type sheep originating from the Spanish "Escurial" and named after the Prince-Elector of Brandenburg (elector), then later the hardy, thick set, wrinkled negretti type originating from the Negretti flocks and called there infantando, which was easier to acclimatize than the electoral, were reared.

In Hungary the merino character was mainly spread by the electoral-negretti breed, later called felt-wooled sheep, developed systematically or spontaneously through the crossing of the mentioned electoral and negretti breeds.

With this felt-wooled sheep, the vital element of profitability provided for by

the wool boom, the earlier multi-purpose sheep-farms, especially on the large estates, were replaced by single-purpose wool producing farms based exclusively on merino wool.

Thus, the merino soon became the dominant breed – mainly on large estates. In Csongrád County only "silk flocks" (merino) and "ordinarius" flocks were known in 1805. In the sheep-farms of large estates the flocks were replaced in a very short time, and the elimination of old breeds was carried out accordingly. In some places of Transdanubia the old common sheep were simply killed off. In the mentioned Esterházy estates not a single one of them was found in a sheep stock of 150 000 in 1819. The "cigája", "pursa" and even the "racka" sheep were crossed with merino, mainly in the eastern part of the country. Novotny, manager of a large estate, tried to cross the Hungarian racka with Spanish sheep as early as in 1792, but the results were not satisfactory(78).

Some authors write, nevertheless, about the Spanish rams having "apparently improved the wool of racka sheep", whereby the price of wool increased more than twofold(79). On the whole, crossing must undoubtedly have been successful otherwise the new breed could not have spread at the mentioned rate in such a short time.

Simultaneously with the establishment of the first merino farm a special course was organized to give the necessary information on sheep breeding. It was also at that time (1773) that a sheep-farming school was established in Croatia(80). The Ercsi estate in Fejér County employed – very successfully – a foreign expert for years to qualify the sheep and staple the wool.

Thus, with the spread of the merino breed, requiring more careful tending and more intensive management conditions, up-to-date management and breeding methods were also introduced, whereby a so far unappreciated factor appeared in the development of sheep breeding in Hungary.

The next step was a changing over from the short-stapled felt-wool sheep to longer stapled cloth- and combing wooled breeds.

The cloth- and combing wool tendency meeting both the demand and the Hungarian conditions started from 1880 with the import of a larger number of Rambouillet sheep. Crossing yielded very good results. Beside a better body conformation these quickly developing animals still produced a fine but longer-stapled wool. So the French combing blood greatly contributed to the components of the Hungarian combing merino developing in a later period.

The merino spread firstly in the northern part of the country. According to the data of the 1911 census the proportion of merino sheep was 2·5 per cent in Transylvania, 8 per cent in the region enclosed by the rivers Tisza and Maros, 17 per cent on the left side of the Danube, 21 per cent on the right side of the Tisza, 43 per cent on the left side of the Tisza, 49·8 per cent in the Danube–Tisza Interfluve and – finally – 70 per cent in the merino-breeder Transdanubia.

Similarly to the case of the Hungarian spotted cattle, the old Hungarian breeds all took part to some extent in the development of the Hungarian combing merino breed.

It is a generally known fact that a great diversity of sheep breeds were reared in the Carpathian Basin(81).

Accordingly, "blood of a large number of breeds circulated" in the merino breeds developed in Hungary, irrespective of how they were called.

J. Schandl, when summing up the development of the Hungarian combing merino, pointed out that the Hungarian racka, and the long-stapled, coarse and thin-wooled German (Franc, Württemberg, etc.) sheep introduced by the German settlers and reared here and there already in the first half of the 19th century, played also some role in it. Both breeds were crossed first with negretti, and later with a French combing sheep which resulted in a merino type becoming dominant in the sheep stock of Hungary. However, the bulk of the Hungarian combing merino stock can be traced back to the felt-wool type merino from which the present type producing a less fine but larger quantity, strong and easy to stretch "combing" wool developed, partly by regular selection (for larger frame, longer staple, moderate fineness), partly by the introduction of "Rambouillet", "German combing" and "German meat-type" blood(82).

According to an opinion based on recent research results the role of the German (Franc, Württemberg, etc.) sheep in the development of the Hungarian combing merino was negligible, while the French combing- and meat-type merinos had a much greater part in it than thought by earlier authors.

According to data of a general statistical survey of farms the percentual distribution of sheep breeds in 1935 was the following:

felt-wooled merino	27·4
combing wooled merino	46·9
meat-type merino	2·5
other (mainly racka, cigája, cikta)	23·2

Just how much the statistical data of breeds based on "admission" or "declaration" are misleading is proved by the fact that while the 1935 data showed 76·8 per cent merino sheep, 94·8 per cent of the wool (6·4 million kg) bought was already in 1925 finer than class *B*, that is, definitely merino wool(83). However, the quality of wool indicates the price paid for it, so it is by all means reliable; and this quality plainly denotes the merino breed. Otherwise, it is only in the sheep-farm that the ratio of breeds can be established with all certainty by the quality of the wool.

It must be added, however, that a one-sided evaluation of statistical data may give a false impression, because not the total volume of coarse and mixed wool was put on the market; a considerable part of it was processed by the domestic industry.

The most important permanent features of the Hungarian combing merino having developed into a separate breed are described below for the inter-war period.

The Hungarian combing merino was a multi-purpose (wool, milk, mutton)

breed. It was reared all over the country. Even today it is the most valuable sheep breed in Hungary as it produces fine wool besides a considerable volume of mutton and milk. Its fertility is satisfactory with twin-lambing ranging from 10 to 30 per cent. As a tough, hardy animal it adapts itself well to the given conditions being a native of Hungary.

The head of the Hungarian combing merino ewe is medium long, while the ram has a broader, shorter head. The forehead is broad, slightly convex. An overwhelming part of the ewes is hornless; some of them have smaller or larger button- or sickle-shaped horns. The rams are either spiral horned or hornless. Horns and claws are of wax-yellow colour. The ridge of the nose is straight in the ewes, and curved and wrinkled in the rams. The eyes are large and lively. The ears of the combing merino are of horizontal position, medium long. The neck is moderately muscled, medium long. The skin on the neck of ewes is occasionally crinkly, rams have only two or three crinkles on the neck. The shoulders are compact, the withers medium long and moderately muscled. So are the back and the loins. The breed is slightly cow-hocked, characteristically humpbacked, with broad, sloping, relatively short hindquarters and medium deep and broad breast. The abdomen of rams is cylindrical, that of ewes larger. The udder is medium large. The legs are of medium length and moderately muscled. The ewes have finer, compact bones, while the bones of rams are heavier and stronger. The skin is compact, elastic, free of pigment all over its surface. However, on the eyelids and ears sharply demarcated small black or red-brown spots may occur.

The fleece has a tufted structure. When freed from grease and dirt its colour is pure white. On the head only the front and the region of the masticatory muscles, on the legs the front part down to the tarsus, the back part to the hock are covered with wool. The average fineness of wool is *AA–A/B*, thus the average thickness of staples is 1/18–25 000 millimeter.

The tuft height is 6–8 cm. The percentage purity of wool (usually) is about 32% on a national average. The shearing weight of ewes is 4–6, exceptionally 8–9 kg, that of rams 6–8, exceptionally 10–12 kg. The average body weight is 40 kg for ewes and 60 kg for rams.

The average milk production of a ewe is about 30 litres a year, with a butterfat content of 7 per cent(84).

Development of breeds

The development process of sheep breeds in Hungary had better be examined on the Hungarian combing merino, since this was the breed whose evolution was the most important event in Hungarian sheep breeding in the inter-war period.

In spite of the fact that the ancient Hungarian animal breeds: the grey Hungarian cattle and the Hungarian racka, were pushed into the background or – we may say with good reason – disappeared at about the same time, the question of breed in sheep farming was totally different from that in cattle farming.

While in the latter case, the different spotted landraces merged – in essentials –

into a new Hungarian breed, on which, finally, a foreign breed, the Swiss Simmenthal left its mark, in sheep breeding we can hardly speak of landraces, and the difference between the various types giving ultimately a uniform character to the new breed, the Hungarian combing merino, was a temporal rather than a regional one.

The felt, cloth and combing merinos were successive categories. It was not countries or regions but periods that they represented, and very characteristically at that, by the various types of wool meeting the demand of the textile industry.

Namely, Hungarian sheep-farms were even then (1920–1945) governed by the aspects of wool, which was only quite natural, as they were compelled to rely on a single utilization: wool production(85).

The above are confirmed by *B. Kovácsy* who pointed out that in 1925 nearly 100 000 kg merino *(AAAA)* wool was unsold in Budapest, that is almost half of the total wool production of the electoral-negretti stock of Hungary. In *Kovácsy*'s opinion the time of the electoral-negretti sheep was over in the same way as that of the grey Hungarian cattle. The existing flocks had thus to be transformed into combing merino(86).

This demand was soon fulfilled, and the Hungarian combing merino thus developed became the most important sheep breed of the country.

The basic material for the development of this breed was undoubtedly provided by the great diversity of sheep breeds reared earlier in the Carpathian Basin, but the one that actually put it into shape was the Spanish origin merino which left its mark on it, suppressing the influence of all the other breeds.

B. Kovácsy made the very interesting remark in 1926 that many were of the opinion that the Hungarian "combing sheep" was not identical with the merino but had evolved by itself under influence of the local soil and climatic conditions, and that foreign blood had never mixed with it, nor was it supposed to do so in the future. Of course, *Kovácsy* himself did not agree with this opinion, as later he clearly pointed out that the Hungarian combing merino had been produced by the crossing of a large-framed, long but coarse-stapled sheep and merino (mostly Rambouillet) rams; this crossing made the coarse wool finer, though not finer than quality *A* or *AA*, and at the same time the staple shorter, though no shorter than 6–12 cm. Unfortunately, we cannot be sure of what it was *Kovácsy* thought of when speaking about "common" sheep. He must have meant racka in the first place, as in the same book he only mentioned racka and cigája sheep in the group of "sheep of non-merino origin". In his opinion the Hungarian combing merino was widest spread in the Great Hungarian Plain, in the districts of the towns Debrecen and Szeged and in the counties Szabolcs, Hajdú, Csanád, Jász-Nagykun-Szolnok, Pest-Pilis-Solt-Kiskun; but hardly any breed other than combing merino was reared in Szatmár, Borsod and Bihar Counties too – wrote he, giving thereby a large part of the breeding districts of the ancient Hungarian racka too(87).

Two conclusions can be drawn from the above. First, we may safely say that it was not only Transdanubia but the entire post-war territory of Hungary that the

spread of the Hungarian combing merino started from. Secondly, it was more or less the Rambouillet breed that gave a uniform character to the Hungarian combing merino, though not at all to such an extent as the Simmenthal did in the case of the Hungarian spotted cattle. It was, in fact, the French combing rather than the Rambouillet breed that was important in this case, as the original Rambouillet did not really belong to the "merino non plissé" i.e. unwrinkled group. In spite of this, the positively French combing sheep of larger frame, but smooth or only moderately wrinkled skin introduced in Hungary were generally called Rambouillet. This incorrect use of the name was extremely misleading; there is no doubt that many rams called "Rambouillet" were, in fact, of French combing breed showing some meat-type merino blood too. At that time (between the two world wars) the difference was rather great between them, even if – as generally known – the Rambouillet was the "founder" of the French combing tendency. Today even university text-books discuss this breed as "The Rambouillet, or the French combing merino", pointing out that the Rambouillet played an important role in Hungarian sheep breeding. Many felt-wooled flocks were transformed into larger-frame cloth-wooled merino, or even into French combing merino by crossing them with Rambouillet. The Rambouillet blood was responsible for the increased body measurement and finer wool of the Hungarian combing merino too(88).

Another relevant statement made by *B. Kovácsy* was that French combing sheep were mainly found in the large sheep-farms of Transdanubia, although flocks of this breed were maintained by some farms in Pest County and the Great Hungarian Plain too. The author added that Rambouillet sheep in its original form was not found any more even in Hungary (1926)(89).

The situation was correctly judged by *M. Rácz* who pointed out that in Hungarian sheep breeding the leading role would for a long time be played by the lowland character "combing sheep" called by the breeders Hungarian and French combing sheep. In his opinion in 1925, 80 per cent of the sheep stock of Hungary belonged to this type(90).

Here we should mention the almost decisive processes not yet considered which made the rapid and general spread of the merino breed possible.

The large estates wanted to change over to maintaining merino sheep, and with this in view purchased rams of this breed. The so-called sharing or itinerant sheep breeders – who on a family or interest basis were professionally engaged in large-scale sheep breeding – made the utmost to develop and improve their flocks with young rams stolen from or exchanged with the best manorial sheep-farms. It happened in this way that e.g. the best young rams were transferred from Transdanubia to flocks of the north-eastern region maintained in summer on the Hortobágy (a lowland area in the eastern part of Hungary), and the "hard" rams of Bihar and Békés Counties to the hilly district of Bakony and to Somogy County in Transdanubia. It is hardly believable today that these shepherd dynasties often managed thousands and thousands of sheep and performed the work of breeding on a professional level exceeding by far that of an average estate. Their method of selection generally consisted of choosing with great competence the best animals

when sharing in the stock, and leaving the larger, more attractive but less valuable, often old animals to the landlord. The other method was the above mentioned "exchange of young rams", which made the successful utilization of several thousands of excellent rams possible every year. This was the reason that in these minor sheep-farms such outstanding flocks were sometimes found as outdoing even the most famous manorial sheep-farms producing rams for animal shows. After the Second World War when collecting and purchasing rams for the developing large farms the author of this book was surprised to see what excellent breeding material these small shepherds possessed. They unequivocally admitted that the rams for service had been "acquired" from manorial flocks. According to most of these expert shepherds "Rambouillet rams reared on church lands" were the best.

I have already mentioned the "meat-type merino" blood, and did it because the French and German meat-type merinos played a more important role in shaping the Hungarian combing merino than suggested by numerical data.

Let me support this opinion of mine by the views of some experts of sheep breeding. According to *I. Kovács*, from the time the first meat-type merino sheep and their crosses appeared on animal shows the interest in its breeding increased from year to year(91).

When writing about the animal show of 1921 *P. Kereszturi*, the well-known sheep breeder and specialist, welcomed the decreasing enthusiasm of sheep breeders about the early developing French meat-type sheep (merino precoce)(92). In spite of this, in 1922 already, he had to admit that meat-type merinos still were the breeders' pets(93).

F. Kemptner (Kemenesy) was of the opinion that in spite of the fact that in every respect the western – mainly German – "Fleischmerino" was considered to be the model of breeding, and all its characteristics had been developed to such an extent as in its habitat, under the special climatic and economic conditions of Hungary its introduction, as it was, was not justified(94).

According to *H. Pöhl* the meat-type merino can be adapted even to the economic conditions of the Great Hungarian Plain(95).

In *B. Kovácsy*'s opinion the combing wool tendency was represented in Hungary not only by the Hungarian and French combing sheep, but later (1926) by the merino precoce, and the German meat-type merino, respectively, too. Rams of these breeds were imported in fairly large numbers, and used – mainly in Transdanubia – for crossing. He suggested the merino precoce to have spread – first of all in Somogy County – possibly as early as in the last years of the 19th century; its larger frame, longer staple, rapid development soon became popular, and in a short time some fairly good sheep-farms were established from which this type was distributed first in Somogy, then in the neighbouring counties too(96).

According to *P. Kereszturi* either the large-framed, rapidly developing meat-type merino, or the high productivity Hungarian combing sheep, cigája and racka were the sheep of the future(97).

In the judgement of *B. Kovácsy* who first described the Hungarian meat-type

merino, those rapidly developing, good conformation sheep of merino origin were to be regarded as meat-type merino whose one-year-old rams were at least of 70 kg live weight and had 7 cm or longer, class *A|B* or finer wool(98). *Kovácsy* had to admit here that the earlier fineness of wool decreased under the influence of the meat-type merino *(A|B)*. This coarser, cheaper wool was, otherwise, sought after at that time by the army too. As a result of all this *J. Schandl* himself suggested that those who had more than one flock may have changed over to producing *A|B* quality wool in some of their flocks giving up thereby the earlier tendency of *A|AA*(99).

J. Schandl thought the great success of the large combing and meat-type merino to be conspicuous(100). In his opinion the French meat-type merino proved to be very suitable for the purpose of crossing with it the smaller and slowly developing merino types whereby the latter developed at a faster rate and assumed a larger frame promising more meat and higher slaughter weight. When writing about the German meat-type merino – that he himself traced back to imports from the regions of Chatillon and Saisson, that is, to French origin – he pointed out that this breed had played an important role in the development of the Hungarian combing merino, and mainly of the Hungarian meat-type merino(101).

The importance of the meat-type merino was thus not denied by any of the well-known contemporary sheep breeders. On the contrary! Some of them even warned not to go too far.

This breed was given a greater role than generally attributed to it because small breeders were particularly interested in the well-shaped animals, and shepherds sometimes covered great distances to find lambs originating from such manorial sheep-farms on the black market.

Summing up the development of the Hungarian combing merino, the most important sheep breed of the period discussed, we have to establish the fact that this breed was "based" on the Hungarian racka sheep. The properties of the latter – though its exterior and mixed-wooled fleece almost disappeared from the Hungarian combing merino – can be detected even today in Hungarian sheep-farms. Its excellent qualities: adaptability, vigour, toughness and resistance, are due in the first place to the racka ancestors. Unfortunately, the Hungarian combing merino cannot be considered a perfectly stable, uniform breed even today, and this was even more so in the inter-war period(102).

From the list of breeds participating in the development of the Hungarian combing merino we must not leave out the ancient sheep breeds of the Carpathian Basin: the cigája, the ancient Hungarian non-racka breed described by *Bökönyi*, and the Central-European "common" sheep and their different bastards(103).

The fact that the milking capacity of the Hungarian combing merino was surprisingly good – at least between the two world wars –, and a milk yield of about hundred litres (Felgyő, Földvárpuszta) was not considered an unexampled output, can be traced back – in my opinion – to the favourable influence of the racka breed(104).

In the case of merino sheep breeders did not initially pay much attention to milk

production. Only its ability of raising the lambs was sometimes an aspect of selection. However, when the overseas wool appeared on the European market, the wool producing sheep-farms were pushed into the background, and Hungarian sheep breeding gradually became a function of the world market prices of wool. As a consequence of all this, when during the economic crisis wool prices fell below the production cost in Hungary and sheep-farming was thereby operated at a loss, the number of sheep was reduced almost to two-thirds. The only reason why this crisis was not dangerous was that at the advice of *J. Schandl* the contemporary sheep breeders began to milk their ewes and turn attention to milk and milk products. They soon realized that the feasibility of sheep farming was determined by milk production, and that the merino – reared so far exclusively for its wool production – could also be a valuable milker. The new method was widely introduced in a short time, and the results came up to expectations. This idea was to make up for the losses caused by the difference between the price and production cost of wool by increasing the milk production. The idea was justified by practice because under the price conditions of those times the value of milk production was one and a half times as high as that of wool production. The Hungarian combing merino, originally developed exclusively for wool production, became thus a dual-purpose breed.

The introduction of the earlier mentioned meat-type merino ranked the meat production with the other uses of the Hungarian combing merino. It is beyond question that the more favourable meat output – expressed in their prices too – of lambs and withers assigned for slaughter, as well as the surplus income attained with breeding animals sold at higher prices owing to their attractive conformation automatically resulted in an increased meat production of the Hungarian combing merino, which was an additional advantage beside the wool and milk production.

Fur production was only added to the uses of the Hungarian combing merino in the inter-war period when the panofix (a specially treated sheep fur) production started.

According to *A. Horn*, *B. Tormay* played an important role in the development of the Hungarian combing merino, not only through the outstanding results attained in sheep breeding, but also by initiating and supervising the regular breeding work of Hungarian spotted cattle, Hungarian combing merino, mangalica, Hungarian Yorkshire pig, Hungarian horse and Hungarian hen. In Hungary that the discussion about the animal breeds to be reared was taken off the agenda relatively early may be attributed to Béla Tormay (105). This statement is in accordance with the facts. When speaking of the development of the Hungarian combing merino, we must not, however, leave the following names unmentioned: *G. Császár*, *I. Kovács*, *B. Kovácsy*, *L. Kozák*, *M. Rácz*, *J. Rodiczky*, *J. Schandl;* nor the efficient work of the National Institute of Wool Qualification established in 1899, and with it the institutional introduction of the system of qualification.

In my opinion, the introduction of qualification was of extreme importance. It was through this system that each animal in sheep-farms rearing the best rams was every year individually supervised and evaluated by the most prominent sheep

breeders and wool experts. It was, in fact, in the course of grading that selection was carried out, and theoretical and practical directives co-ordinated on a national scale were given. It was, at the same time, a good opportunity for competent experts to meet the practical sheep breeders (stewards, shepherds), so on such occasions of qualification, science and practice came to terms. Through the exchange of experience and by consultations sheep breeders were gathered in one camp, in the strictest sense of the word.

To sum it up: the sheep stock of Hungary was fully – and today we can safely say in full numbers – transformed into a merino character stock because

the merino was the only breed whose wool met the new requirements of the textile industry;

it fitted in the framework of intensive farm management;

through its properties and demands it proved more favourable than any other breed;

its excellent transmitting ability made it extremely suitable for crossing;

it was easy to acclimatize;

the Hungarian combing merino was able to become a three- and even four-purpose animal;

this breed may be said to have become the only profitable sheep breed in Hungary;

after the First World War merino breeding animals could almost exclusively be sold;

its spread was generally promoted;

its rearing was officially supported by the National Institute of Wool Qualification;

the breeding objectives set could be widely realized through qualification.

Pig breeding

When Hungarian pig breeds and their development in the inter-war period are to be studied, attention is almost exclusively absorbed by the question of "meat-type pig", or more precisely, the development of the Hungarian Yorkshire pig which spread later all over the country.

In the same way as the intensive tendency of farming developed the Hungarian spotted cattle through the Swiss breeds, and the industrial development produced the Hungarian combing merino through the merino breeds – so the white Hungarian Yorkshire pig emerged with the new way of life created by the general progress of the 20th century.

However, finding the basis of pig breeding in Hungary is not so easy and simple as with the grey Hungarian breed in cattle breeding, and the ancient Hungarian racka in sheep breeding, because in pig breeding there was no such ancient Hungarian breed which provided a basis for development in later times.

In outlining the past of Hungarian pig breeds there are but a few sources to rely

on. Moreover a correct assessment of the relevant information is hindered by a great many unreliable data, statements and opinions.

All that is known with absolute certainty is that the Celtic and Avar pigs were the oldest pig breeds in the Carpathian Basin. There is nothing whatsoever that would make it probable that the first Magyar settlers brought along some kind of ancient pig breed. On the basis of the osseous remains it is highly probable that in the 10th–15th centuries the ancestors of the later, so-called mountain pigs were maintained in the Carpathians. In the region east of the river Tisza the "szalontai" pigs were widely distributed. In Transdanubia the "bakonyi", in the south-western part of the country the "siska" and "túrmezei", in the Danube–Tisza Interfluve the ancient lowland breed, while in the south-eastern part of the country – in the district of the rivers Tisza, Kőrös and Berettyó – the meadow pig were kept. It was supposedly at the time of the Turkish wars that from the north the Polish, and from the south the "szirmai" pigs were introduced into the Carpathian Basin(106).

The great change occurred in the 18th–19th centuries when the continuous crossing of the mentioned breeds with Serbian pig breeds brought forth the so-called Hungarian "mangalica" breed, which with its excellent qualities soon became the most important pig breed in Hungary of that time.

Thus, instead of going far back into the past, it seems the best to take the mangalica – the most important breed of pre-war times – for a basis, by analogy with the grey Hungarian cattle and Hungarian racka sheep, to which the breeds of the period under discussion can obviously be traced back.

The Hungarian mangalica pig

While – as mentioned already – the ancient breed was represented by the grey Hungarian cattle in cattle breeding and by the Hungarian racka in sheep breeding, in pig breeding no similar ancient Hungarian breed as encountered in the period concerned can be spoken of.

There were two reasons for this. It is not probable that the conquering Hungarians brought along pigs; after the First World War the oldest pig breeds of the Carpathian Basin could only be found in traces, at the very most.

The mangalica, generally known as, and called a Hungarian breed, the only dominant one at the beginning of the 20th century, had not originally been a separate breed in Hungary, but a product of crossing between a number of old Hungarian breeds. Pig breeds suitable for fattening in the Carpathian Basin (lowland, bakonyi, etc.) were crossed over a long period with breeds originating from southern regions, and the small size lard-type pig thus produced was the Hungarian mangalica which was finally developed into a larger-bodied uniform character breed by the excellent breeding animals of the "sumadia" strain of Kisjenő originating from the Topsicsér farm of the Serbian Prince Milos(107).

This excellent Hungarian lard-type pig of European fame – similarly to the grey Hungarian cattle and the Hungarian racka sheep – was increasingly pushed

into the background in the inter-war period and was already a declining breed in spite of the fact that a decrease in its numbers did not yet show it.

At its best the Hungarian mangalica pig was a medium large, definitely extensive, lard-type animal. At the turn of the century its colour was "always fair", the claws were black or dark slate-coloured. The black mangalica was produced by crossing with the black Syrmian landrace. The mangalica was characterized by thick, soft, curly hair. After the First World War it was described as a medium sized animal. It was added that farmers did not like larger than average size animals as they found them to be less inclined to fattening. The favourite type was then the long- and deep-bodied mangalica with short legs and medium long snout called "big-bellied" at that time, because, according to general experience, this type showed the best feed conversion(108).

One of the greatest advantages – and later the greatest disadvantage – of the mangalica was its excellent suitability to extensive conditions of farrowing, grazing and management; by producing lard and bacon much sought after at that time it efficiently utilized the maize.

I think, when discussing the mangalica breed we must not leave unmentioned the National Association of Mangalica Breeders established in 1927 which played a highly important role in the herd-book registration, and in an organized co-operation of breeders, and successfully performed the social tasks related to the work of breeding.

Other breeds

Beside the above described Hungarian mangalica the old pig breeds of the Carpathian Basin were not already worth mentioning at that time. The lowland, "bakonyi", meadow, "szalontai", etc. breeds had merged in the new types, first of all in the mangalica breed. Thus, when speaking now of other breeds only breeds of foreign origin introduced into Hungary had better be taken into account.

In the later development trends of Hungarian pig breeding the main role is generally known to have been played by the white meat-type pigs of English origin, and the Hungarian Yorkshire pig developed, essentially, as a consequence of this.

Accordingly, these breeds will be evaluated and their role and importance discussed in the chapter dealing with the Hungarian Yorkshire pig. Here other foreign breeds will be presented.

Of the breeds belonging to the group of black, black spotted and belted meat-type pigs the Berkshire, Cornwall, Essex and Poland-China played some role in Hungary.

The Berkshire breed is given preference even today in the southern part of Bács County. According to *F. Kertész* it was developed at the beginning of the 19th century when in Berkshire, England, a local breed was crossed with Chinese and Siamese pigs. In the course of breeding work, besides the wild pig, Neapolitan, Portuguese, Suffolk and finally Essex breeds had been used for crossing until the Berkshire breed was ultimately produced.

Since 1884 it has been reared and officially registered as a pure-bred animal(109).

This breed was sought after because of its fertility, rapid growth, excellent feed conversion capacity, adaptability to extensive conditions (tolerance to dry, hot weather and intensive sunshine) and suitability to crossing (especially with the mangalica breed). According to a county report farmers of Csongrád County readily used Yorkshire and Berkshire crosses for fattening purposes(110).

It is well characterized by *L. Schweiger*, renowned Hungarian pig breeder who wrote that when looking for porkers not requiring strict management conditions for his lowland farm, and finally choosing the Berkshire breed, his choice was fully justified by the eight years' experiences(111).

To the best of my knowledge the oldest breeding stock in Hungary was at Kisbér to where the basic stock had been transported from England in 1890. On the whole, this breeding stock provided material for other Hungarian stocks too. The excellent properties of this breed are shown even today by minor breeding stocks scattered in the country; the most prominent of the different crosses of this breed, the Bázna landrace, is reared in Transylvania(112).

The other black breed then playing a role in Hungary was the large black, or Dornwall pig similarly of English origin produced by crossing the South-England common pig with Neapolitan, Portuguese and Chinese breeds(113). *B. Dorner* was of the opinion that the Cornwall was "a pig for poor conditions"(114). Among its good properties we may mention that – though not developing quickly – it keeps its ability to grow for a long time and becomes a very large animal; its fertility, and even more its ability to raise piglets are excellent; it is tough and hardy, and though not tolerating the intensive sunshine well, is not too sensitive to weather due to its rough skin and thick fur. According to *Dorner* the fact that it was frequently encountered in the factory workers' sties in the suburbs of Budapest (Kispest, Pestújhely, Erzsébetfalva) proved the good properties of the Cornwall pig(115).

The farm inspectorate of Abaúj County reported in 1937 that in its mountain district 18 young Cornwall sows were distributed in the previous year which, mated with mangalica boars, produced first rate progenies(116).

In the inter-war period the breeding stocks of Gubacspuszta, Pötréte and Sárvár are worth mentioning. The latter pig-farm was established in 1908 with original English breeding animals on the Ikervár estate(117).

The Cornwall breed is widely reared now in the Danube–Tisza Interfluve and in the southern part of Bács-Kiskun county, though it occurs elsewhere too, mainly in Szabolcs-Szatmár County.

The Essex and the German belted breed, as well as the Poland-China pig – which is sometimes of a colour similar to that of the Berkshire, sometimes spotted – belonging to the above group did not play any considerable role in Hungary. The Essex breed was introduced by farmers of Pozsony and Nyitra Counties in 1870, while the Poland-China breed was imported by *B. Dorner jr.* from Illinois and introduced into the Tata estate, Komárom County. The Old Gloucester, a large-bodied, rough-furred, white but black spotted unpretentious breed, with an excellent ability to raise piglets is only mentioned here in passing.

An English breed not belonging to any of the above colour groups was the red-brown Tanworth pig. *B. Dorner* characterized this breed in the mid-twenties as follows: "It is not a fine animal, similar to the German unbred *(unveredelt) landschwein,* but has the advantage of being hardy, suitable to extensive management, conditions; among the modern English breeds it is one of the best 'grazing pigs", and added: "in Transylvania I found fairly good crossed brick-red Tanworth pigs in some Saxon farms and in the 'csángó' (Hungarian-speaking natives of Moldavia) farms of Brassó-Hétfalu, but in 1919 I saw some rather good ones in the fattening farms of Kőbánya and Nagytétény in a stock requisitioned by the National Pig Marketing Bureau mainly from the western counties of Hungary, indicating how long the effect of an imported breed is felt in the peasant stocks"(118).

The mentioned black and black spotted pig breeds could not spread to such an extent as the white ones did in Hungary, in spite of their advantageous properties, if only because the latter could always be sold more easily and at a somewhat higher price. *B. Dorner*'s remark deserves being quoted here word by word: "Strangely enough, the black English porker breeds are not willingly purchased by the Hungarian meat trade because of the darker skin and the black hair bulbs left behind in the skin and brawn. This is the reason why the white furred and pale pink skinned foreign pork breeds are preferred in Hungary, although underthe Hungarian weather conditions the rearing of cold- and heat-tolerant, hardy black furred English pig breeds more resistant to diseases and less demanding is more profitable and involves less risk." He added: "This differs from the demand of western countries or even of big markets of the neighbouring countries where only the quality and not the colour is regarded and paid for"(119).

Hungarian Yorkshire (meat-type) pig

Pig breeding in Hungary resulted finally in the evolution of the Hungarian Yorkshire pig.

In the inter-war period this breed did not, in fact, exist, and it was not more than the bases of the later so important breed that could be spoken of in that period.

In Hungary—and in the Carpathian Basin, respectively,—the concept of meat-type pig as interpreted in the past and in our days is not the same, partly because the Hungarian meat-type pigs of the past centuries were not identical at all with the porkers of mostly English origin of later times, and partly because in Hungary the general usage knew but one lard-type pig, the mangalica, and placed every other breed indiscriminately into the group of meat-type pigs.

The former—Avar, Balkan, Bulgarian prickly, mountain prickly, Kassa, Polish (small-eared, large-eared), Moldavian, Romanian prickly, meadow, "szalontai (Ugra, Görbed, Siska)—were only more or less meat-type pigs. Namely, pig breeds which partly by conformation, partly due to management conditions were lean, thin,—that is, by no means fat producers—were in the past placed in the

group of meat-type pigs. Otherwise these breeds and their various crosses either merged into the mangalica, or were completely eliminated(120).

The latter—the meat-type pigs of the 20th century—were developed decidedly for this purpose and kept exclusively for pork production. Of these breeds of English origin mainly the *white* "Yorkshire", Lincolnshire, middle white, large white, German and that called improved German, the *black* (black spotted, belted) Berkshire, Cornwall, Essex, Poland-China, and the *rust-coloured* red-brown Tanworth breeds played a considerable part in Hungary in the inter-war period. *B. Dorner* himself mentions roughly the same breeds when describing Hungarian pig breeding in this period(121).

Of the meat-type pig breeds the white porkers of English origin were undoubtedly the most important ones, as they were given the leading role in evolving of the Hungarian Yorkshire pig.

At the time when the Hungarian Yorkshire pig was evolving a number of other meat-type pigs were also introduced into Hungary. The most outstanding of them were the large white pig of English origin, the German full-bred and the German improved pigs. Hungary imported a relatively large number of other —mainly Dutch—and English white meat-type pigs too.

Besides rearing full-bred animals Hungarian porker breeders fell in with the current market demands and crossed the above breeds, thus trying to find the breed most suitable for Hungarian conditions and—at the same time—meeting the demands of meat industry.

In evolving the Hungarian Yorkshire pig the mentioned large white English porker played the leading role. Its characteristic shape was, namely, taken over by the Hungarian Yorkshire pig. However, of the breeding animals imported from abroad only those blood lines were maintained in the Hungarian breeding stocks which were able to keep their fertility under the feeding and management, as well as extreme climatic conditions of Hungary.

Beside the leading role of the large white English pork pig, other white meat-type pigs had, naturally, also a part in evolving the Hungarian Yorkshire pig.

When enumerating these white breeds two groups have to be distinguished. One of them—the earlier group—included the "Yorkshire" and Lincolnshire; the original form of these breeds did not prove to be suitable. The other group—the later one—included the middle white, the large white, as well as the German improved porkers whose blood can be found in the Hungarian Yorkshire pig even today. To avoid any misunderstanding—although the matter will be discussed later in detail—it seems to be right to note that the "Yorkshire" breed put consequently between quotation-marks is not identical with the breed generally called large white, but a type of much finer structure, much more pretentious, only called "Yorkshire" in Hungary because it was first imported from that shire. This is the explanation of the apparent contradiction that while holding a poor opinion of the "Yorkshire" I praise its close relative, the large white pig.

The above mentioned "Yorkshire" and Lincolnshire were more or less discarded because they were not sufficiently resistant to diseases. Moreover, Hun-

garian breeders wanted to maintain these intensive pig breeds under extensive conditions similar to those provided for the mangalica, and did not ensure either the required feeding or optimum housing for them. No doubt, it was through and at the expense of these animals that they learned the elements of rearing English porkers. The failure naturally ensuing from these attempts may have been the reason why meat-type pig-breeding that had an upward trend at the end of the last century showed later a temporary decline under the influence of bad experience.

The above facts are confirmed by reports sent to the Ministry of Agriculture by the farm inspectors of the Transdanubian counties carrying on a more intensive farm management. For example "Yorkshire" pigs purchased with government support and distributed in Tolna County did not prove good in common breeding. A large part of the distributed breeding stock perished, since small farmers maintained this breed under the same management and feeding conditions as the mangalica(122).

Later (1933) the county farm inspectorate reported that 90 per cent of the Yorkshire sows distributed among small holders perished or became degenerated(123).

The farm inspectorate of Somogy County was also of the opinion (1931) that the development of meat-type pig breeding was greatly hindered by the high percentage of death cases and the bad marketing conditions(124). This opinion was rather general even in 1936; according to a report from Tolna County, the meat-type pig did not prove good in small holdings because of its being pretentions(125). A report of Csanád County (1936) gave account of the gradual elimination of meat-type pig-farms found here and there on large estates(126).

The first "Yorkshires" were imported by the advanced farm managers of sugar factories in North-western Hungary. The first larger pig-farms included, further, the ones at Somogytarnóca and Lábod. For the former Count F. Széchenyi imported a "Yorkshire" boar directly from England, and three sows from the Vienna World Show 1873(127).

Similar pig-farms were earlier the ones at Sárvár, Béllye and Munkács. Outstanding "Yorkshire" farms in the inter-war period (with the year of establishment indicated in brackets): Csényeújmajor (1885), Devecser (1920), Fehérvárcsurgó (1923), Győrszemere (1925), Kisdorog (1902), Nagygeresd (1901), Pázmánd (1919), Répceszentgyörgy (1901), Somogytarnóca (1873), Süttőr (1903) and Szilvamajor (1925).

By giving the year of establishment for the major "Yorkshire" farms I wish to prove that this direction of breeding was far from being such a failure as stated by many authors, since of the pig-farms mentioned there were only two "old" (1873–1885), and four "new" (1901–1903) ones, while ten of them were explicitly of "later" establishment (1919–1925).

This opinion of mine is supported also by the contemporary remarks of *M. Rácz*: "Under Hungarian conditions the Yorkshire breed has two excellent properties: quick adaptability, and unparalleled feed conversion"(128). "Meat-type pigs, in the first place the Yorkshire pig, can undoubtedly be reared in Hungary in the

best quality, and it is beyond question that the preconditions of its successful breeding can be easily provided for in any part of the country"(129).

The surprising statement *(L. Schweiger)* about the wide distribution of the "Yorkshire" pig in Trans-Tisza is also appropriate here(130). According to *B. Dorner* "in Hungary – like in other civilized countries – Yorkshire is the widest spread pig breed on most manorial estates, and even on peasant small holdings, in some places (Vas and Sopron counties) of Transdanubia"(131).

According to a contemporary publication, the auction held at Zalaszentgrót on 23 October 1923 in the course of a meat-type boar campaign was very successful(132).

It is not so much a question of the Yorkshire breed having failed in Hungary as the other similar English breeds having proved better (middle white, large white), so that breeders gradually changed over to them. It was for the same reason that the German improved, and occasionally other similar (lowland) breeds were also given an increasing role – similarly at the expense of the "Yorkshire" pig.

Lincolnshire pigs were first imported in 1873, to the Sontagh pig-farm at Ferihegy(133).

A description of "Livestock-breeding in Hungary" published in 1926 only mentions three Lincolnshire pig-farms. They were in a chronological order of establishment at: Pápa (1912), Alsószilvágy (1918), and Celldömölk (1919)(134). Later, in post-war Hungary such pig-farms were no longer established. It must be noted, however, that in 1924 Lincolnshire pigs were still imported from England, though mainly to the old breeding stocks to introduce fresh blood. While pure-bred Lincolnshire pigs were no longer reared in Hungary, their crosses undoubtedly had some part in Hungarian pig breeding. A noteworthy attempt was the crossing of mangalica sows with Lincolnshire boars. Their progenies were called "linkolica". These attempts were soon given up in spite of favourable initial results. In the twenties, as a student of the Keszthely Academy of Agriculture I myself came across the traces of these crosses. It was, otherwise, stated by *S. Konkoly* too that experiences gained on Szelényi's university model farm showed the Lincolnshire × mangalica crosses to be favourable in every respect(135).

At the beginning the Lincolnshire breed was generally thought well of: "we have to change over without any delay to the mass breeding of meat-type pigs . . . Lincolnshire is a breed of the future" – wrote *J. Kutas*(136). Fertility was considered in Hungary to be a great advantage of the Lincolnshire breed, and in this way it came to assume some role in improving fertility in the Hungarian mangalica pig.

There were two reasons for this breed later falling out of favour in Hungary. First, to use *B. Dorner*'s words "these otherwise well shaped, rapidly developing, easy to fatten, quiet temperament animals have the great disadvantage of being highly susceptible not only to infectious diseases but also to heart and lung diseases, in other words, show a high rate mortality". He added: "It is interesting that its almost degenerated poor physique, and often annoying high susceptibility to diseases (once experienced at my cost but seen in many other cases too) are complained of by Germans as well"(137).

Let me give the other reason as formulated by *S. Konkoly* and *H. Pöhl*: "With the increased demands of our days the Lincolnshire crosses do not suit the purpose of ham production"(138).

In my judgement it was not so much because of what has been told that the Lincolnshire breed was pushed into the background, but mainly because in spite of its English origin, white colour and intensive management conditions it was not a true meat-type pig. And being a lard-type pig, it could not spread at a time when meat-type pig breeds came into prominence.

This is confirmed by a highly authentic opinion in which the Lincolnshire "differs from the other English breeds not only in strength and in its breed being completely different from the mangalica, but also in being a lard-type rather than meat-type breed, or more precisely, a meat-type pig with propensity to fatten"(139).

The medium large white meat-type – by its original name middle white – breed, which was itself a hybrid (English small white × English large white) was given a role in Hungary mainly in crossing. For the purpose of producing fattening pigs it was successfully crossed with mangalica pigs. The middle white had a considerable part in evolving the Hungarian Yorkshire breed.

The large white meat-type pig – according to its original name large white breed – was also a product of crossing. It was evolved in England in the middle of the last century through the crossing of the small white pig of England with the large Celtic–Germanic local pig. Its excellent qualities, primarily suitability to bacon processing, soon made it popular; having spread widely this breed played almost everywhere a leading role in developing a great diversity of white meat-type pigs. It happened in this way that this breed became an important component of the Hungarian Yorkshire pig.

The "ancestors" of the Hungarian Yorkshire pig include, further, German white porkers. Of them the German improved pig originating from the German local, English large white and middle white breeds and the German improved pig produced by crossing the North-German Celtic–Germanic lowland pig with various English breeds, mainly with white porkers, were the most prominent ones(140).

As far as I know the first imports of these breeds took place at the beginning of the twenties, mainly from Hannover, Westphalen and the region of the Bavarian Neuhof. As far as I can remember the spread of this breed was greatly enhanced by the fact that in autumn 1924 *S. Bischitz*, large leaseholder, imported a really excellent improved boar from the Karlsburg pig-farm of Count Bismarck-Bohlen in Germany to the Tolnamajsa estate(141). In the thirties in the pig-farm at Endrédújmajor(142) managed by me there were also original German imported improved boars used for breeding by introducing new blood. The largest volume import of these pigs took place in 1943 when the National Association of Meat-type Pig Breeders imported 80 German improved meat-type boars and 120 broodsows(143).

In the middle of the twenties *B. Dorner* pointed out that not only the German chauvinism was responsible for the name "German improved" given to this breed

instead of an English name ("Yorkshire" understood here), namely, it was not through continued breeding of the imported pigs in pure blood that this breed was maintained by the Germans; it was produced by a repeated back-crossing of the progenies to Yorkshire (middle white and large white) until its exterior became similar to the original "Yorkshire"(144).

And what is even more interesting—and precisely determining the role of this breed in Hungary—the German improved pig that would have met the demands raised by Hungarian breeders on the basis of earlier imports could no longer be found in Germany at that time (1942)(145).

In the inter-war period well-known pig-farms keeping German pigs were: Felsőszolgaegyháza (1923), Ujnéppuszta (1922) (non-pure-bred); Balatonszárszó (1923), Karácsond (1923), Kisbér (1923) and Nagynémetegyháza (1923) (pure-bred). (In brackets the year of establishment.) In this case pig-farms were established—almost without exception—in the same year.

I should like to add that meat-type pigs (Mecklenburg, Westphalen, Meissen, etc.) were imported from Germany to Hungary as early as at the turn of the century, but those breeds were either eliminated, or merged into other breeds losing thereby their characteristic features.

It was thus the large white breed that played the leading role in the development of the Hungarian Yorkshire pig. However, this does not mean at all that the importance of either the middle white or the "Yorkshire" could be neglected, if only because —when thinking it well over—both the large white and middle white breeds had earlier been called Yorkshire in Hungary. That is why I consequently put the word "Yorkshire" between quotation marks, since such breed did not, in fact, ever exist, and at the most the white porkers originating from Yorkshire, North-England, were probably called in Hungary by the collective name Yorkshire—indicating their origin. Up to the end of the twenties Hungarian Yorkshire pigs—already evolved by that time—were also widely called "York". This was not, otherwise, a special Hungarian phenomenon, since the local white meat-type breeds developed essentially by the use of the large white breed are—even now—generally called Yorkshire almost everywhere in the world (Holland Yorkshire, American Yorkshire, Canadian Yorkshire, etc.). Still, it must be noted here that in Hungary economic interests were involved in the use of the name "York". *B. Kenessey* hit the nail on the head by writing: "Under the name Yorkshire we shall always sell our animals, while it is a question whether we would attain favourable results with the name white Hungarian meat-type pig . . ."(146).

I should like to point to the fact that the meat industry preferred first the middle white breed because of its ham, while later, with the rising demand for bacon, priority was given to the large white breed. Furthermore, meat-type pigs were not exclusively imported from England; in 1923 e.g. more than 300 meat-type pigs were imported from Germany and Holland with the moral support of the state(147).

From this large import of 1923 an expert committee *(E. Mesterházy, O. Wellmann, L. Willen, B. Melly, D. Demkó, S. Konkoly)* selected the most valuable ani-

mals and organized with them a pig-farm at Zalaszentgrót(148) with the collaboration of *D. Elek* and the Pig Trade Office. Unfortunately, this pig-farm was soon closed owing to various diseases – first of all epizootic abortion –, but the surviving animals were bought up by the estates.

In *B. Kenessey*'s opinion, if it is a question of commodity production, the Hungarian Yorkshire × Edelschwein seems to be the most suitable for producing ham-pigs. For bacon-pig the Hungarian Yorkshire × large white, or middle white × large white are the best(149).

On the road leading to the development of the Hungarian Yorkshire pig the above were the first definite, correct and successful steps. All this was later unambiguously justified. Although pig breeding in the inter-war period was not able to fully develop this breed, it created all preconditions for its final development, and so the Hungarian Yorkshire breed was, in fact, the achievement of the period discussed.

Breeds

When studying the proportion of pig breeds in the inter-war period we find that lard-type pigs – first of all mangalica – were no longer dominant, and their importance slowly but unmistakably further decreased in spite of the fact that the internal market was still interested almost exclusively in lard and bacon. A part of the limited exports also provided similar possibilities.

The new meat-type pig breeds appeared, and slowly but steadily began to spread opening thereby a new direction for development.

It is the English porkers that deserve recognition in the first place.

The importance of porkers of English origin was in due time realized by experts. Some of them praised the English breeds from the very beginning though carefully adding that their advantages were only reliable when regularly stabled and abundantly fed. In the case of rearing animals in the open-air all the year round it was better to stick to the old Hungarian breeds(150).

The national conference of pig breeders took up a position on the question of breed already in 1873 declaring that "beside our mangalica breed we have to see to it that meat-type pigs suitable for export are reared"(151).

Irrespective of all this, the high fertility, rapidly developing, large-bodied new breeds of excellent feed conversion developed by the English breeders in the 1860's were heard of in Hungary too, and called the attention of Hungarian breeders – who suspected a good business – to these breeds. In addition, meat prices began to rise, and the general living standard not only permitted but decidedly called for finer products of the meat industry (prime quality ham, mixed cold meats, etc.). Their consumption generally increased, and butchers ultimately began to seek after and pay more and more for the meat-type pigs required for these products. It was rightly pointed out by *B. Dorner* that this process was given a great impetus by the butchery products of Kassa and Prague transported mainly to Budapest, the capital, where the wealthier strata willingly bought, and consumed

in increasing quantities the chops and hams of Prague, and the cold sausages made according to a German model(152). Later, in postwar times, in consequence of a changed consumer taste the demand of the butchery industry for meat-type pigs increased both quantitatively and qualitatively, with the view to satisfying the total demand of the domestic market(153).

At the 1905 National Conference on Livestock Breeding *J. Pirkner*, lecturer, spoke up for the meat-type pigs, and even then thought it justified – with special regard to the increasing milk production and development of dairy-farms – to propagate the meat-type pigs. The government supported the rearing of meat-type pigs ("bacon-factory" at Szabadka, imports from England, other material supports, etc.), that is why these breeds could spread, mainly on large estates, to an increasing extent. It has to be noted, however, that small holders were also willing to maintain meat-type pigs. The members of dairy co-operatives in Bácska and Torontál Counties alone imported 500 pork-pigs from England (1905). Later, in 1911, 2870 meat-type sows were distributed in the southern counties(154).

The spread of porkers of English origin became thus quite general. In spite of the fact that the determination of breeds is rather uncertain, especially in the case of pigs – where the crosses and very often even the lean mangalica porklings were registered in the meat-type pig column – still we give the relevant data below in the hope that such errors were roughly the same everywhere, and so the data are suitable at least for comparison.

Year	Percentage proportion of meat-type pigs
1926	5·7
1930	12·7
1935	20·2

The spread of English breeds was also promoted by the fact that the butchery industry taking increased interest in meat-type pigs continued to seek after the meat of mangalica pigs for the growing Hungarian salami production (Pick, Herz) so the lard and meat-type pigs were not compelled to enter into competition with each other.

The popularity of porkers of English origin was further greatly enhanced by the rapid progress of dairy-farms and the favourable marketing possibility of by-products (skimmed milk, whey, buttermilk, cheese scraps), the importance of which can hardly be emphasized enough. Protein feeds of animal origin were excellently utilized by these new pig breeds, and in a short time meat-type pig-farms were established by the side of almost all dairy-farms.

Practice gradually developed a pattern in which mangalica was the breed for extensive, and the meat-type pig for intensive conditions of management.

According to *B. Dorner* "meat-type pig-breeding is highly justified in Hungary as we can utilize through it the by-products of our dairy-farms (skimmed milk, whey, buttermilk), the refuse of potato production, the clover and lucerne fields,

and – by processing the porklings – satisfy the requirements of our pork consumers; in addition, with the prime quality butchery products absorbed by the urban markets of Hungary in increasing quantities we can cover our domestic consumption, and beyond this – as shown by examples of the last years – are able to export (a number of butchers in Budapest exported ham made after a Prague fashion even to Paris)"(155).

Of the "symbiosis" between meat-type pig breeding and dairy-farming a few characteristic examples will be given from reports of farm inspectors.

In Sopron County – as reported in 1925 – the extension of the dairy-farm also gave a great impetus to the breeding of meat-type pigs(156). According to a report of Bihar County (1932) the decline of the dairy-farm seriously affected the breeding of meat-type pigs too(157). A report of Szabolcs County (1931) points to the difficulties of selling skimmed milk and buttermilk explaining them by the fact that no considerable pig breeder is found yet in the district(158). In Abaúj-Torna County – according to a report of the Farm Inspectorate – pure-bred English porkers are only reared on a few farms having larger dairy units too(159).

The breeding of meat-type pigs was also encouraged by the demand of meat packers for young bacon (Pápa, Szeged) and ham pigs. The constant and reliable demand of a meat packer at Kapuvár was also favourable for meat-type pig breeding(160). This demand was not, however, confined to Sopron County. The meat packer of Kapuvár e.g. purchased a large number of young ham pigs from southern counties and even from Zala.

Knowing the role and importance of the major meat-type pig breeds in Hungary, the next step to be taken is to study the general development of meat-type pig breeding in Hungary. This question is very important because the development of meat-type pig breeding was far from even, and many difficulties had to be overcome. Still, at the end the results were outstanding.

The main obstacles to the spread of meat-type pigs were – as mentioned already – the high susceptibility of these breeds to diseases, and the higher capital investment and competence required for the intensive management conditions of meat-type pigs. Meat-type pig breeding was only an occupation for large estate owners or wealthier small holders, but in either case for breeders carrying on a more intensive, higher level farm management. The elite of the contemporary agricultural population was undoubtedly composed of sugar beet producers and meat-type pig breeders.

In many cases the protection of the mangalica breed checked the progress of meat-type pig breeding. Such phenomena appeared particularly in the Great Hungarian Plain where farming was of extensive character. In Hajdu County e.g. it was generally believed that the question of breeding meat-type pigs had to be handled with the greatest possible care lest some inconsiderate steps should be taken at the expense of the excellent and well-proved mangalica breed(161). Csanád County reported on the failure of the meat-type pig campaign (1931); farmers lost on meat-type pig breeding, as the mangalica reoccupied the first place due to it on the market. The report added that on farms of small holders and poor people

only the mangalica could cope with the conditions(162). The town of Szeged explicitly wished the spread of the mangalica breed by insisting that instead of the extremely degenerated pig stock found all over the Great Hungarian Plain, foundations for breeding a fair Hungarian mangalica type should be laid down(163). Of course, the salami and sausage production of that region (Szeged, Gyula, Békéscsaba) found the necessary raw material in the mangalica, and this fact considerably influenced the tendency of breeding. In an interesting way, Csongrád County reported on a bacon processing plant established at Szeged as early as in 1929(164). The mangalica breed was praised in a report of Bihar County (1916) according to which the local pig type still had good properties that could be developed; and that alkali soils in Bihar County promoted the development of pigs was proved by the fact that the big fattening farms in Transdanubia paid a price for young pigs higher by 10–15 fillér/kg than that paid for mangalica herds of the same age when bought in other places. All this seemingly praises the Bihar type, but appreciates, in fact, the original fair mangalica. As a consequence of this view the breeding of meat-type pigs stagnated, as farmers began to return to the mangalica – reported the Farm Inspectorate of Jász-Nagykun-Szolnok County (1937). According to the reason given in the report the local climate and the extreme conditions suit the mangalica better(165). All these phenomena could be, in fact, traced back to the general economic crisis, namely, the worse the economic conditions grew, the more the primitive, cheaper, extensive breeds came into prominence. Intensive breeds could not be profitably reared at that time.

At the National Livestock-Breeding Conference held on 9th April 1921 *S. Konkoly* called attention to the question of meat-type pig breeding, which – in his opinion – was made timely again by the competition of, and demand from abroad. He emphasized, however, that he still attached a great importance to the mangalica breed especially with its deficiencies eliminated(166).

The prospectus of an animal show organized that year tells us that meat-type pigs were, unfortunately, found at the show in very low numbers, although the interest in them was great(167).

An evaluation made by the Ministry of Agriculture pointed out that the highly promising meat-type pig breeding had run up in 1923(168). The number of villages wishing to change over to breeding meat-type pigs was constantly increasing – reported in 1926 the Farm Inspectorate of Sopron County(169).

Not much later, in 1927, on the other hand, *S. Bischitz* wrote about a temporary crisis in meat-type pig breeding(170).

Three years later the Farm Inspectorate of Sopron County reported on a "York fever" catching the people(171). *B. Dorner* pointed out again that "the change-over to meat-type pig breeding is now a real fever"(172). This opinion seems, however, to have had some propagandistic tendency especially when considering that it was written by the President of the National Association of Meat-Type Pig Breeders. A general "fever" could hardly be spoken of at that time, since the highly authentic *J. Blantz* made it quite clear that the uncertainty caused by the danger of swine-fever threatening meat-type pigs in contrast to the mangalica,

remained(173). An animal show in 1930 undoubtedly suggested a certain equality of rank, as of mangalica boars 72 per cent, and of meat-type boars 71 per cent were sold to breeders(174).

The favourable conditions of 1930 are indicated partly by a report of Baranya County, according to which one-third of the county's pig stock became almost overnight meat-type pig(175); partly by the fact that e.g. in Győr county the "meat-type pig" campaign excited keen interest among the farmers(176).

M. Rácz summed up this question in 1932 as follows:

"1. The meat-type pig only supplies valuable market products when produced in unobjectionable quality. And this requires a lot of expensive protein rich feed, while the mangalica – on the basis of the principle of self-sufficiency – can easily adapt to given economic conditions. In the case of a shortage of funds or feed it can be kept in the open-air all the year round, but with an improving economy, under better management conditions, the intensity of its rearing can be increased according to need.

2. As regards the export, the meat-type pig has to face a much keener competition than the mangalica, which is undoubtedly unrivalled on markets of interest to Hungary.

3. Although the various diseases of piglets such as swine-fever and infectious abortion in either of the two breeds make breeding extremely hazardous, still in the general practice the fight against them is more effective in the mangalica"(177).

Moreover even the relative value of the individual meat-type pigs and their usefulness in Hungary was a bone of contention and opinions were quite contradictory(178).

There were other problems with the meat-type pigs too. According to the 1938 report of the Chamber of Agriculture meat-type pig breeding was for some years in an unfavourable situation owing to low prices. Breeding activity was pushed into the background, and pig-farms were engaged with the problems of marketing. The increasing prices of meat-type pigs in 1936 and 1937 made the breeding of meat-type pigs profitable and turned the attention again toward the breeding work(179).

The quotation of meat-type pigs began on the market only in 1926 in thousand crowns. The price of lard and meat-type pigs starting with 1927 can be found in **Table 49.**

(In the case of lard-type pigs the prices refer to old, medium quality pigs; while with the meat-type pigs to young ham pigs, in each case in the initial period of the year concerned.)

The data show that the prices of meat-type pigs were always higher than those of lard-type pigs. This difference in price indicates, however, certain difference in quality as well, since the ham pig generally was a first class, while the old, medium quality pig always a second class commodity.

When comparing the prices to those in 1928 representing a peak we find that (a) the prices only exceeded the 1928 level under the influence of a war boom; (b) with the exception of war years the price of the lard-type pig never was higher

Year	Lard-type pig		Meat-type pig	
	Pengő	Per cent of 1928 price	Pengő	Per cent of 1928 price
1927	1·34	91·8	1·52	95·0
1928	1·46	100·0	1·60	100·0
1929	1·34	91·8	1·50	93·8
1930	1·34	91·8	1·60	100·0
1931	1·05	71·9	1·20	75·0
1932	0·74	50·7	0·80	56·3
1933	0·79	54·1	0·95	59·4
1934	0·72	49·3	0·92	57·5
1935	0·56	38·4	0·70	43·8
1936	0·70	47·9	0·90	56·3
1937	1·02	69·8	1·08	67·5
1938	1·00	68·5	1·06	66·2
1939	0·88	60·3	1·00	62·5
1940	1·94	64·4	1·20	75·0
1941	1·46	100·0	1·52	95·0
1942	1·86	127·4	1·66	103·7
1943	1·94*	132·9	1·98*	123·8

Table 49. Price of lard and meat-type pigs

* official top price.

than that of the meat-type pig; (c) the prices of lard and meat-type pigs showed a roughly parallel trend.

When studying the price trends we can establish a further two facts that may have been characteristic of the interrelation between lard and meat-type pigs. The changes in the economic situation – either in a positive or in a negative direction – had roughly the same influence on the prices of lard and meat-type pigs. The other fact was that the wind of the Second World War disproportionately forced up the prices of lard-type pigs. This was indicated, otherwise, by the official prices too which only showed then 4–5 fillér differences compared to the 15–20 fillér differences of "free" prices developed by the economic crisis. This latter phenomenon clearly shows that the relatively low price level of the meat-type pig was determined by the interests of war economy.

A further characteristic fact: lard-type pigs over 150 kg remained duty-free, while the duty of the meat-type pig was 18 gold crowns after a volume corresponding to 50 per cent of the 1930 export, and 45 gold crowns for the rest(180).

It was a rather old question, whether the new meat-type pig breeds – and meat-type pigs in general – were adapted exclusively to the large-scale conditions of manorial farming, or could be profitably reared on smaller peasant holdings too. *B. Dorner* was quite right in pointing out that meat-type pig breeding on small holdings was only justified in places where common pastures were not found, where lucerne was grown on a considerable acreage, and ensured as a pasture as well, and finally, where appropriate dairy refuse was available(181). A proposal was made by *L. Witthen* that beside the improved breeding animals, an improved stock would also be necessary(182). In addition to the more pretentious

"English" pigs a type developing late and less demanding was also required for small farmers(183). This was later realized by the small breeders themselves, who tried to adjust their pig-farms to the general trend of development and the more intensive conditions by maintaining various crosses, especially in Transdanubia. Some are of the opinion that in the mid-thirties meat-type pigs already played a more important role in the small farms(184).

In my judgement meat-type pigs could be efficiently reared in peasant holdings only in places where at least tolerable management conditions, and protein rich feed possibly of animal origin which utilized the by-products of dairy farms, supplemented with lucerne could be ensured, and where there was a possibility of some sort of separation, since meat-type pigs reared in herds could not tolerate the almost constant danger of epidemics. In such places good results were reached with the hybrid vigour, the heterosis effect produced by crossing generally with meat-type pigs. On the country markets the peasants actually sought after, and paid higher prices for such spotted, pale, mixed, "baris", "zerna", spotted-bellied, and spotted-dug piglets and young boars. The farm inspectorate of Vas County also reported (1938) on a great interest shown by the trade in pigs of mixed blood(185).

This was experienced in larger fattening plants as well. Mixed pigs were ready in a shorter time. Favourable fattening results could mainly be attained with first-cross herds—wrote *M. Csécsi Nagy* (1941)(186). According to a contemporary expert opinion, in general practice the progeny of the first cross showed "wonderful" vigour in growth, feed conversion and production. Certain estates maintained two kinds of pure-bred stock (mangalica and English porker) in order to be able to use the first progeny always for fattening(187).

It must be noted here that in those days only mangalica pigs were fattened in the industrial fattening plants; meat-type pigs were fattened by the farms they were reared in(188).

All this boils down to one question. How did it happen that through an almost unbroken line of progress Hungarian pig breeding changed over to the meat-type line and produced finally the excellent Hungarian Yorkshire pig?

The answer is rather simple. The success of the Hungarian meat-type pig breeding apart from its intensive character had another very important source: the activity of the National Association of Meat-Type Pig Breeders. This organization set the objectives of breeding with great competence, organized the breeders efficiently, smoothed the differences and suppressed the factions. It managed the imports successfully and amalgamated the breeders into one large "family". All these results were attained by a readiness to help manifested in useful advice and practical assistance (organization of marketing, breeding animal auctions, feed supply, etc.).

In the year of foundation the Association registered 80 pigs in the herd book. This figure increased to 1 605 by 1938, and 3 339 by 1942(189).

In my judgement the greatest merit of the Association was that it never modified the breeding objectives and did not allow any inconsistency. The establishment

of the Association was due to the first director, *S. Konkoly-Thege*, while its results were associated with the names of the subsequent directors, in the first place *B. Dorner* and *F. Kertész*.

The establishment of the National Association of Meat-Type Pig Breeders in 1923 represented a turning point in the development of a white meat-type pig suited to Hungarian conditions, even according to the present university textbook. The Association had an important part in developing the new breed. It was on the basis of its objectives and co-operation that a purposeful and systematic breeding work taking individual properties into consideration began. It was the result of this work that a white meat-type pig meeting the requirements of the Hungarian butchery industry and representing a separate breed was produced in Hungary(190).

When summarizing the question of Hungarian meat-type pig breeding I should like to express my opinion that while the appearance in the progenies of the favourable properties of English porkers (fertility, rapid development, excellent feed conversion) undoubtedly had a favourable effect on the tendency of breeding, still the recognition that these properties would only come into full display under appropriate – i.e. more intensive – management conditions, was even more important. This was the general experience that induced the breeders to set up higher level management, feeding and tending conditions.

It is here that the question running through the whole history of Hungarian livestock husbandry, and much discussed even today, is raised: whether it is right to spread a new breed which while producing more and at a lower cost, is more exacting, when it is a generally known fact that the production of an intensive breed put under extensive conditions will be lower, of poorer quality and – above all – much more expensive than that of the old, extensive breed under the same conditions.

While from a biological point of view it is strictly forbidden to rear an intensive breed in a place where its demands cannot be fully satisfied, from the point of view of breeding policy it is of tremendous importance that often these very demands help to create better conditions of management. Namely, the new, intensive breed responds to higher level management by increased production, and this makes the breeders realize that a more intensive way of management of the new, intensive breed – though requiring a higher input and more care – is indisputably a good "business".

To avoid any misunderstanding, it is only the effect of a highly spectacular practical demonstration that I have spoken of. The proper demonstration of sound principles cannot, naturally, be without a professional knowledge and the appropriate correct approach which are of decisive importance in every field of livestock breeding. All this appeared particularly strikingly in the field of pig breeding, that is why I have considered it right to speak about it.

To put it briefly, while the development and general introduction of the Hungarian spotted cattle and the Hungarian combing merino can be traced back to quite a number of causes, the successful evolvement and spread of the Hungarian York-

shire pig had only two sources: first, the requirements of an increasingly intensive farm management as well as the general trend of development supported this breed, secondly, the National Association of Meat-Type Pig Breeders could completely accomplish its task.

Horse breeding

While in the field of cattle, sheep and pig breeding uniform Hungarian breeds were produced (Hungarian spotted cattle, Hungarian combed merino, Hungarian Yorkshire pig) through the synthesis of breeds of various intensive character and of western origin and landraces, we cannot speak of a similar process in horse breeding. On the contrary, in the inter-war period, horse breeds which had evolved earlier in Hungary developed separately. No doubt, the effect of intensive farming was felt in horse breeding as well. The efforts to develop the so-called "economic type" led to more or less similar breeding objectives in all horse breeds and resulted finally in the appearance of the Hungarian halfbred horse.

In addition, in the inter-war period the military demands were still felt. The other, less important demand on horse breeding was raised by transportation. In my opinion, suitability for agricultural work was at that time a mere phrase, since the horses used on farms mostly drew carts, seed drills, etc., that is, it was, in fact, "transportation" that took place in this case too. This applied more or less to the army too, since the horses of the artillery and the Army Service Corps were already more important at that time than the chargers. Thus, the influence of utilization on breed acted everywhere in the direction of suitability for transportation. I think that it was this demand that finally created the above mentioned concept of "economic type". Not the type itself, but an idea of it.

Choosing the methodology used so far for the examination of the question of breed in horse breeding we can hardly start from another basis than the once so famous ancient Hungarian horse.

It was on this basis that the subsequent variations of breed were built through which, even if not a new, up-to-date Hungarian horse breed, but the so called Hungarian halfbred developed; this may be regarded as a close analogy to the Hungarian spotted cattle, the Hungarian combing merino sheep and the Hungarian Yorkshire pig.

The ancient Hungarian horse

By the time of the First World War this once world-famous horse breed had merged into a mass of various crosses and new types so much that it could no longer be spoken of as a "breed" in the period discussed.

Its origin and days of glory have been explored by a number of authors(191). To say a few words about its past, the Eurasian wild horse was the ancestor of the breed. In its evolvement the "taki" (*Equus caballus Pallas, E.c. Przewalskii* Pol-

jakoff), a type of the country of origin had some part, but the main role was played by the higher quality "tarpan" (*Equus caballus Gmelini* Ant.), a type somewhere along the road of migration of the ancient Hungarians. Since the peoples living in the Carpathian Basin – with the exception of the Avars – had not maintained horses in any considerable number before the arrival of the Hungarians, this ancient Hungarian breed became rather wide-spread in the regions inhabited by Hungarians, and as an almost sole breed for centuries developed – through a selection of unparalleled meticulousness – into an extremely tough, hardy, resistant breed of rather uniform type and good heredity.

This world-renowned breed with its excellent qualities was hardly crossed with other breeds – outside the manorial stud-farms. I do not agree with the following – rather generally accepted – division of the history of Hungarian horse breeding into four periods:

1. Hungarian horse: from ancient times to 1526
2. eastern horse: from 1526 to 1711
3. Spanish horse: from 1711 to 1814
4. English horse: from 1814 onward.

Apart from the fact that this division is based on historical events mostly independent of livestock breeding (1526 was the year of the first Turkish victory at Mohács; 1711 that of the peace treaty of Szatmár at the end of the Kuruts wars), it has been made on the basis of documents referring to the horse stock owned by the Hungarian nobility rather than by the serfs, and does not show thus the national development.

Up to the abolition of serfdom (1848) the ancient Hungarian breed dominated in number among the horse breeds.

The eastern horse was not generally introduced into the peasant farms, at least not to such an extent that a period – beginning in 1526 – could have rightously been named after it. The conquering Turks took rather than brought horses.

The Spanish horse had almost no part in popular horse maintenance; neither did it play an important role in the manorial stud-farms.

As to the evolvement and spread of the English halfbred, it was so much later than the first import of English thoroughbreds (1814) that a period of English horses cannot even be spoken of before the turn of the century.

When examining the further development of the ancient Hungarian horse we find that this originally excellent quality but with a too high temperament owing to its too small size later became more and more out-of-date, and slowly degenerated. Count I. Széchenyi already had a rather poor opinion of the ancient Hungarian horse and recommended the English thoroughbred to improve it(192).

According to the above, the ancient Hungarian horse, in spite of its great past, was pushed into the background at the turn of the century. Let me cite here a description from 1869: "The Hungarian horse is small and insignificant, but – notwithstanding its size – strong, with taut tendons and contractible muscles; its

endurance is extraordinary. Its structure, relatively broad chest contributes to the sound development of large lungs; besides its early training, this is responsible for its unusual quickness and persistence in running"(193). The unequalled properties of the ancient Hungarian horse later rapidly declined. "The old-time horse is virtually lost . . . the old blood has been mixed so much that it can be encountered only occasionally" – wrote a contemporary(194).

The ancient Hungarian horse was described by an expert at the turn of the century as follows(195): "Its size is 130–155 cm, its head disproportionately large, lean. The neck is narrow and rather long, deer-neck is frequently encountered; the withers are mostly high, and at the same time sharp. The back is medium long, mostly narrow. The loin is wrongly formed being long and narrow, and the rump behind it swayed; pig- and goat-like rumps are very frequent, the tail is well placed and so are the mane and forelock, rich in hair. The breast is rather well shaped though not too broad, the flanks are flat. The groins are mostly very hollow, and the haunches protruding. The forelegs are rather well shaped, but the hindlegs highly objectionable. The bones are poor, castors frequent; the shanks are usually fairly well shaped, only their direction is not perfect inasmuch as the poor hocks are generally bandy; the splint is regular but the pastern mostly soft. It is generally chestnut coloured." The horse thus described is called "unimproved Hungarian peasant horse" by *Kovácsy*. In his opinion "the exterior of this horse is highly objectionable, but its hardiness, toughness and unpretentiousness are unparalleled"(196). This latter feature was thus its greatest value.

The ancient Hungarian horse was known in different variations. A larger and more proportionate type was the so-called *improved Hungarian horse*; the *Transylvanian horse*, a type essentially identical with the ancient Hungarian horse only made more valuable by systematic and effective breeding; further variations worth mentioning were the small Székely (Eastern Transylvanian) horse, and the shaggy-maned and tailed pony.

Other breeds

In enumerating the horse breeds found in Hungary in the inter-war period the horses of Arab origin have to be mentioned first to be followed by a discussion of the English halfbred horses in the chapter dealing with the Hungarian halfbred.

According to the contemporary designation the Arab "thoroughbred" and Arab "halfbred" belong here. Arab thoroughbred horses were only maintained in the Bábolna Stud-Farm established in 1789. Even here only three stallions and 22 mares were "thoroughbred"' in 1925. Thoroughbreeding was thus rather limited and carried on exclusively with the view to making an appropriate stock available for producing Arab halfbred horses. Arab halfbred does not mean here a type originating from crossing the Arab breed with other breeds, but horses produced by crossing thoroughbred horses with non-thoroughbred but in any case Arab horses.

The Arab halfbreds reared in Hungary differ from those bred in Western-European countries inasmuch as the Bábolna type is a perfectly balanced, homogeneous breed with reliable transmitting ability. Thus, the Arab horses of Bábolna were halfbred only by name, in reality they could be qualified as a pure-blooded breed, since in the last century – apart from introducing fresh blood every now and then by crossing with Arab thoroughbreds – the most careful inbreeding was carried on at Bábolna.

According to a description from the inter-war period most of the Arab horses of Bábolna called at that time halfbred – apart from certain families, like e.g. the Shágyiák, having become somewhat stronger through pedigree selection – hardly differed from the true Arab horse of the desert either in external or in internal properties, only they were optimally fed and cared for, in sharp contrast with the Arab horses born and raised in the desert amidst hunger and privations. At the Paris World Exhibition in 1900 all the important Arab stock-farms of Europe were represented, furthermore Turkey and Syria, with original Arab horses and Bedouins in the saddles, who at the sight of the fine Arab horses of Bábolna were green with envy(197).

This enthusiastic description is made authentic by the fact that a stallion (Koheilan I.) and a mare (Shagya 88.) of Bábolna won the highest prize, the "grand championnat". The large gold medal too was given to the Arab thoroughbred mare O-Bajan 4. of Bábolna(198).

The breeding of Arab horses is justified by the advantages of this breed. According to *I. Ócsag* the Arab horse is a product of the combination of geological and climatic conditions, unsparing use, natural selection, and to a lesser extent of the breeding art of Arabs. Its most outstanding properties are: unpretentiousness, toughness, hardiness, graceful carriage, lively temperament, tractability, long life. It is due to these excellent properties that there is no cultural breed whose evolvement or maintenance was entirely unrelated to the Arab horse(199).

Contemporary classification – in the twenties – distinguished four major types in the Arab halfbred.

The first of them was of the highest quality, a light medium sized halfbred resembling the ancestors of the desert. The second was a halfbred of English-Arab character. This latter occurred when "in the progeny the hereditary features of the English parent met those of the Arab parent" – wrote *H. Döhrmann* about this type(200). The third type was of common or average Arab character, more bony, larger and quieter than the former type. The fourth group included the larger Arab halfbreds which had the appearance of a larger English halfbred and were thus suitable for composing attractive teams for horse carriages.

The breeding of Arab halfbreds would have deserved – in my judgement – a more substantial support, and a greater emphasis in public and occasionally manorial breeding too.

"Of the larger private stud-farms unfortunately only a few are engaged in breeding Arab horses, although ten or twenty years ago there were about thirty private Arab halfbred stud-farms in the country" – lamented *H. Döhrmann* at that time(201).

Of the Arab halfbred stud-farms of Hungary in the inter-war period – apart from the Bábolna establishment – important stud-farms were at Rétszentmiklóspuszta (1763), Tata (1918) and Pallag (1920). (The year of establishment indicated in brackets.)

I think that the decreased importance of Arab horses was not exclusively caused by an overestimate of the English halfbred, since an attempt to increase the bulk of body – soon proved otherwise a mistake – had some part in it too. An article signed *Alpataky* seemed to be of the same opinion. "The tendency to increase the body size of the Arab horse can be said to be wrong, for experience has shown that the Arab horse, when artificially grown, loses its character, its toughness, and even shows deficiencies of bones"(202). Otherwise, this was not even necessary, because in popular breeding – mainly for small peasant use – the small-bodied, unpretentious, tough type would have been suitable. In an earlier opinion, in Hungarian common breeding the Arab horse always was and would remain the animal of poor people and poor soils(203).

The next breed we have to deal with is the Lippizan horse. This breed too is "really the horse of the poor" – wrote *Döhrmann*(204). It "merited" this opinion by its excellent qualities, of which the following are worth mentioning: unpretentiousness, toughness, excellent bones, a uniquely steady carriage, very hard hoofs, attractive movements, and intelligence coupled with tameness and docility.

The breed is relatively old. The Lippizan stud-farm was established in 1580 at Lippiza, 7 km away from Trieste, on a bare, stony, karstic soil rich in lime, extremely suitable for training horses for unpretentiousness, endurance and toughness. The stud-farm was established with Andalusian, Spanish, Neapolitan and Danish horses, and was later transferred first to Fogaras (1875) then to Bábolna 1912.

Besides the Bábolna stud-farm only five private Lippizan stud-farms are known to have functioned in the mid-twenties in Hungary. In the chronological order of establishment they were at: Öreglak – originally Terezovác (1860); Pusztaszer (1888); Rádiháza – originally Pankovec (1894); Csornapuszta (1902) and Tata(1918).

The Lippizan breed played an important role in improving the horse stock in the mountain regions of the Carpathian Basin. I myself have experienced its high working capacity, good nature, and excellent quality of keeping in good condition. For its decreased importance I hold the excessive Anglomania responsible, which tried to increase the body size of this breed by crossing it with the English thoroughbred. This attempt finally turned out to be a complete failure.

The army did not consider the Lippizan horse to be suitable for military purposes, as it was no good as a saddle-horse, and there were many grey horses in this breed. This feature of colour was regarded so much a disadvantage that at the war front the white and grey horses were painted violet.

Compared to the less important Arab and Lippizan breeds a much greater role was given – or at least should have been given – to the Belgian draught-horses "muraközi", "pinkafői", and to the crossed horses (Belgian draught-horse × warmblooded breeds).

A few words will now be said about these breeds in general.

Before the First World War only one state stud-farm – at Kisbér – dealt with Belgian draught-horses. A breeding stock was already established here as early as in 1859. At the beginning experiments carried on with many kinds of stallions failed until, finally, the breeding stock of Ardennes proved suitable. The stock thus developed – a total of seven mares of Ardennes type – later (1897) was transferred to Bábolna, where it was completed by 30 "muraközi" mares; first Ardennes stallions were used, but later experiments were made with Arab, and even with Lippizan stallions.

As to the activity of the government in this line, little care was taken of the Belgian draught-horses; only faults were found with it, even at the expense of economicalness(205).

For the source of this attitude we can hardly find other causes than the almost exclusive demand for light (warm-blooded)horses, based on the military organization of the First World War, and the experience gained in the war where heavier type horses proved inefficient.

In my judgement this inaptitude indicated the drawback of a more pretentious character. *G. Podmaniczky*, a well-known expert of horses at that time, pointed out already in 1916, in a lecture delivered in the National Hungarian Economic Society, that "the Belgian draught-type horse proved to be the least fit. I do not want to be too lengthy" – he added – "only to emphasize that a horse of which quick work cannot be expected, and – in addition – requires plenty of feed and much water, is sensitive to weather and soil conditions, cannot be suitable for military purposes, is no army horse"(206). Here it must be noted that in an earlier report *Gy. Zsámár*, assistant lecturer at the College of Veterinary Sciences, – when speaking of a time of sound feeding conditions – praised the Belgian draught-type horses even under the conditions of war(207). This question was analysed with extreme thoroughness and objectively, and at the highest level of competence by *S. Konkoly-Thege*, on the same basis of experience gained at the war front. In his judgement the draught-type horses were less resistant and more exacting in the war than the Hungarian halfbreds. However, he was subsequently quite positive about the small "muraközi", as well as the draught-type landraces of Sopron and Zala Counties having proved fit for military purposes. He pointed out, at the same time, that big horses were found completely useless(208).

The Hungarian halfbred horse

As already mentioned before, we do not find any up-to-date Hungarian horse breed developed in the period discussed on the analogy of the Hungarian spotted cattle, Hungarian combing merino and Hungarian Yorkshire pig. In spite of this fact this empty place can be filled with the rather uniform character though varying type "Hungarian halfbred" originating from Hungarian crosses of English thoroughbreds.

In this group of Hungarian halfbreds the Nonius, the "gidrán", the "mezőhegyesi" and the "kisbéri" are worth being mentioned in the first place.

The Nonius was a rather rapidly developing draught-horse type of Anglo-Norman origin crossed with eastern, Spanish and mainly English thoroughbred horses, suitable both for agricultural and military purposes. Its characteristics praised to the skies were not, however, unequivocally proved in practice. It holds especially true to the so-called "big Nonius" horses. They were mostly praised by those who did not know them. For example Sopron County which, in fact, stood by the draught-type horses, reported in 1923 that – since the farmers of the district of Csorna could not reconcile themselves to breeding warm-blooded horses – the agricultural committee of the district proposed the establishment of a big Nonius breeding district(209). Of the better known landraces of the Nonius breed – the tougher "hortobágyi" and softer "mezőhegyesi" – the former proved more suitable.

A. Horn underlined *O. D'Orsay*'s pioneer work in the evolvement of the Mezőhegyes landrace of the Nonius breed and found an interesting analogy with *I. Ujhelyi*'s initiations. In his opinion both of them patronized the small breeders with their activity, and both laid emphasis on determining and controlling the working capacity, and creating better marketing conditions(210).

The generally yellow coloured "gidrán" rather famous for stubborness were, in fact, of Arab or Anglo-Arab origin. They were first of all coach and saddle-horses. *I. Ócsag* noted that suitability to draught work in this breed showed individual variations(211). The obstinate and provocative nature of the gidrán is a characteristic example of the phenomenon that when a method of selection is not perfect, or the selection is not continuous, counter-selection appears at once. In the inter-war period mares with a bad working capacity, unsuitable as coach-horses were sent to the stud-farm where the possibility of reproduction was higher, and so this unfavourable line had an advantage over the other ones although it ought to have been excluded from breeding(212).

The "mezőhegyesi" halfbred is, in fact, a progeny group of the – later intercrossed – progenies of Furioso and North-Star. It was superior to the Nonius, but at the same time more demanding.

In comparison to the type "mezőhegyesi", the "kisbéri" is – according to *H. Döhrmann* – a better quality, higher-blood halfbred landrace(213). In spite of the fact that in the inter-war period the mentioned author did not know this "landrace" yet, in the representation of the Kisbér state-owned stud-farm clearly described the object of breeding: "to produce high-blood English halfbred stallions with a fine carriage and stronger bones for national horse-breeding" – describing thereby the type called later "kisbéri" halfbred(214).

The contemporary literature made but very slight distinctions concerning halfbred rearing in Hungary, and gave explanations of stylistic rather than objective nature. Today we are at a loss when reading these analyses of Hungarian halfbred rearing, and the subsequent measures taken.

For this very reason I shall try to throw light – as much as possible – upon this question from a modern viewpoint.

In the inter-war period horse breeding in Hungary was practically managed by

the magnates, "new landlords", tenants, army officers as well as by other wealthy, snobbish bourgeois and the inner circle of the horse trade. The English thoroughbred, and horse-races organized with this breed were the basis. This noble, highly profitable but at the same time expensive hobby was based financially on the totalizer. Horse-racing everywhere and always is an excellent business for everybody – except the betters – but first of all for the state, owners of horses, managers, trainers, jockeys, stablemen, bookmakers, employees of the totalizer, etc.; and indirectly for a wide range of exploiters (press, sellers, cabmen, news-boys, etc.).

Thoroughbred rearing in Hungary was set back by the war, partly because during the war stud-horses introducing fresh blood into the stock could not be imported, partly because the thoroughbreds mostly became spoils of war, and because the racing horses of Hungary grew too old in the meanwhile. In the last period of the war horse-races were not even regularly held any longer, moreover, the old race-course was ploughed up.

Restarting of the gallop-races after the destruction of the First World War demanded especially great sacrifices.

The establishment of the new race-course, and the imports too, required very high financial investments the return of which had somehow to be provided for. The efforts made to this end had two consequences; they gave an impetus to thoroughbred rearing on the one hand, and started the breeding of halfbreds, on the other.

The question of thoroughbred and halfbred rearing was dealt with at that time by the Ministry of Agriculture, in fact, according to the demands of the army. However, the reins were actually held by the interested persons organized into the Hungarian Jockey Club. A part of them had an influence on the authorities, while others were influenced by them. This interdependence thus made certain co-operation possible from the beginning, with the view to maintaining an undisturbed racing with English thoroughbreds. So it was not difficult to find out what should happen to the old thoroughbreds unsuitable for racing and removed from the race-course. The solution was obvious: halfbred rearing had to be made general. The halfbred farms thus swelled – state and private farms equally – required more and more thoroughbred stud-horses, and for the sake of promoting the cause of halfbred rearing, were ready to pay a high price for horses that could no longer be used in the race-course – and were in excess in thoroughbred rearing.

In this way the English thoroughbreds got into general breeding, and the "production" of various types of halfbreds was promoted by the most diversified explanations, proclamation of halfbreds as a separate breed, demonstrations, shows, newspaper articles, etc. The highest prize of the animal shows in the inter-war period was given almost without exception to English thoroughbreds, according to the reasons given, for the good of agriculture and the army, but in fact the racing-stables profited by it.

In this way the most diversified English halfbreds were produced and the "English blood" spread all over the country.

All this was not, naturally, harmful to Hungarian horse-breeding; the blood

of one of the most excellent horse breeds of the world was distributed in the country, so we can even approve of it.

We have to cite here a remark of *S. Konkoly-Thege*, which can be regarded as the summarization of a brilliant series of his papers analysing the horse-breeds of Hungary: "the adequate types of the Hungarian halfbred horses have stood comparison with any other breed"(215).

It was not the halfbred itself at all that caused troubles, but the fact that in the inter-war period these types and the "English blood" in them were excessively propagated by the authorities and by circles whose interests were identical with the objectives of the former. The greatest fault was that all this happened at the expense of the Arab, Lippizan and – above all – draught-type horses.

I gladly add the opinion of Dr. *Weiss*, Director-General of Livestock-breeding, head of the German delegation participating at the 1937 animal show: "Hungarian horse breeding in general, and halfbred rearing in particular are at such a high level that their leading role among the European countries is indisputable"(216).

In the inter-war period halfbred rearing was mostly carried out by two methods. In the so-called popular breeding, generally English halfbred, while in the stud-farms thoroughbred stallions were used. In the English halfbred stock two main types were distinguished at that time: the heavier and the lighter English halfbreds. The latter comprised two further types: the high-blood halfbred and the common, light halfbred – according to the extent English thoroughbreds had influenced their development too(217). According to *S. Konkoly*'s opinion it was not a general rule that the progeny of each English thoroughbred stallion should be a "light" halfbred(218).

Changes of breeds

Examination of the changes of breeds in the inter-war period is a complex task, so it requires a thorough analysis of the question.

We have to establish in the first place that from the point of view of utilization the horse breeds of Hungary could be roughly divided into four groups at that time: racing, saddle, coach and draught-horses. Horses produced for the army were partly saddle, partly draught-horses, so in the field of general utilization the military aspects soon became identical with the "civil" requirements.

The official state management was twofold. Namely, the actual breeding work was carried out at that time by the military squads of the stud-staff, with the similarly "military" commandants of state-owned stud-farms – under the "civil" guidance of the Horse-Breeding Department of the Ministry of Agriculture. However, when looked at more closely, this duality was a mere illusion, and the supreme authority – if not institutionally – was practically represented by the Defence Ministry which was under the influence of the highest circles. The highest circles included the above mentioned Hungarian Jockey Club too.

The seemingly perfect co-ordination of military, economic and racing aspects

concealed, in fact, the silent but all the more desperate fight of multifarious conflicting interests of different groups and persons. Unfortunately, this prevented the development of a uniform type of "Hungarian farm horse" on the analogy of the Hungarian spotted cattle, Hungarian combing merino and Hungarian Yorkshire pig.

In the inter-war period the following major horse-breeds were maintained in Hungary:

Racing-horses: English thoroughbred and American trotter.

Useful horses: light English halfbred (Furioso, North-Star, "kisbér"), Nonius (small and large), "gidrán", Arab, Lippizan; heavy and light "Muraközi", "Pinkafői" and the mixed type crossed horses (Belgian draught-horse × warm-blooded breeds).

Under the influence of these breeds, naturally, certain landraces developed in horse breeding too. These landraces, however, – though representing biotypes adapted to the management and utilization conditions of different regions – clearly showed the main features of the original breed. They were the Nonius-type horses of Tolnatamás, Szabolcs, Hortobágy, Mezőhegyes, and the draught-type horses of Hódmerővásárhely and – perhaps – Baranya County.

A true picture of horse breeding in Hungary in the inter-war period is given by *I. Ócsag*. According to this, on poorer sandsoils in the Danube–Tisza Interfluve and east of the river Tisza lighter, lean, enduring horses resembling the charger were reared. On the alkali soils of the Great Hungarian Plain the small "sziki" (alkali) Nonius developed. In Transdanubia a more bulky saddle and draught-type horse was maintained, while on the richest soil of the country (Békés, Csanád, Csongrád, Bácska) the largest size, warm-blooded breeds were reared. In the western and southern parts of Transdanubia the Belgian draught-horse became more and more wide-spread. The type of Baranya County was a heavier Belgian horse, while the others were lighter, often showing the character of mixed-type crossed horses (Belgian draught-horse × warm-blooded breeds)(219).

To speak of the racing-horses in this place would be beyond the scope of the subject, so I only mention in passing the dominant role of the English thoroughbred.

In the group of useful horses the halfbreds, and of them mainly the Nonius, "gidrán", "Mezőhegyesi" and "Kisbéri" types are worth special attention.

The question of breed in the Hungarian horse breeding of post-war times (1920) was best characterized by the following details of one of *H. Döhrmann*'s publications: "The broken-down horse breeding of Hungary is not able to recover . . . on one side the group of those trying to force the Belgian draught-horse upon the agriculture of the poor, mutilated country – with the wrongly interpreted slogan of increasing the intensity of production – forgetting that by this they deprive the army of one of the most important means of defence: the horses suitable for this purpose. On the other side the admirers of the English racing-horse and of the nervous, light jukker and high-blood charger, who only think the Hungarian to be happy if each farmer has such a delicate animal in his stable"(220).

The National Conference on Horse-Breeding held in December 1921 turned against the breeding of Belgian-type draught-horses designating the halfbred based on Nonius and Furioso as the breed suitable for satisfying the draught-power requirements of agriculture(221).

Studying the contemporary literature we can clearly see that, while the authorities were for the English halfbred, the farmers themselves, especially the Transdanubian peasants, began to prefer draught-horses and mixed-type crossed horses. For example in Fejér County the question of breeding Belgian-type draught-horses was put on the agenda, because the farmers showed an increasing tendency for taking up these types(222). Attention later turned increasingly toward the western draught-type breeds. Among the farmers, the desire to rear draught-type horses was growing stronger and stronger – reported the Farm Inspectorate of Győr County (1932)(223). According to the statement of the Farm Inspectorate of Baranya County (1933) the reduction of the number of draught-type horses was striking. A great many farmers were compelled to sell their expensive horses and buy hacks called "warm-blooded" for a part of the purchase price(224).

A part of the contemporary experts of horse-breeding paid special attention to the importance of the heavier (draught-type) breeds and suggested promoting their breeding(225).

The publications of the contemporary special literature revealed that apart from the fact that the Hungarian draught-type horse of those days was finer, more vigorous, tougher, more unpretentious and showed a higher resistance, its rearing costs were much lower, that is, it was a much cheaper breed. The demands raised on this horse breed can be roughly summarized as: the optimum Hungarian draught-type to be evolved was a farm horse finer and lighter than the western draught-horses, and suitable for trotting as well(226).

In accordance with all this, the Belgian-type draught-horse breeds and parallel to them the mixed-type warm-blood and draught-type bastards became more and more wide-spread mainly in Vas, Zala and Somogy Counties and in certain parts of Sopron and Baranya Counties. Komárom and Esztergom Counties also it was pointed out (1929) that crossing with draught type horses was a widely used practice in horse breeding(227).

The Committee on Horse-Breeding of the National Hungarian Economic Association established the fact that the too large body gradually lost its dominant role(228).

Years later, in the thirties, even the official policy of horse breeding was compelled to acquiesce in the new tendency corresponding to the changed views, and undertake as a government task the development of draught-horse breeding. For this purpose those competent chose the Belgian-type(229). At last it was laid down that a horse that stood the test in drawing a heavy agricultural machine would be able to draw a cannon too(230).

The draught-type horses became ever more easy to sell. According to the report of Tolna County e.g. the rapidly spreading draught-type horse breeding did much harm to the good reputation of horse breeding in the county. The more rapid

development of the draught-type foal and the big money paid for it, dazzled the farmers(231). The manorial estates and larger leased farms in Bihar County also gradually changed over to maintaining draught-type horses(232).

Their importance was even increased – as pointed out in the report of the National Hungarian Economic Association too – by the growing interest shown abroad in draught-type horses(233). The general progress was well characterized by the fact that the breeders of draught-type horses even held a conference in January 1943(234).

According to data of an agricultural statistical survey in 1935, 20·5 per cent of the total horse stock of Hungary was made up already of draught-type horses. These data were more reliable than the corresponding data on cattle, sheep and particularly pig breeds, as the draught-type horses were, in general, correctly separated from the warm-blooded horses in Hungary. At that time the Hungarian – at least the peasant – was rather a judge of horses. Table 50 has been compiled on the basis of the statistical data of 1935 (235).

It is highly remarkable that the competition between warm-blooded and draught-type horses resulted finally in a certain degree of synthesis. This process is indicated by the following formulation of the report made by the National Chamber of Agriculture concerning the year 1943: "The tendency to develop heavier, farm-type warm-blooded horses on the one hand, and brisker, medium heavy draught-horses, on the other, is more and more clearly seen in horse breeding"(236).

The draught-type breeding tendency was backed up – in addition to the mentioned stud-farm at Bábolna – by a number of manorial stud-farms rearing pure-bred Belgian horses and Belgian crosses. In the chronological order of establishment they were: the farm of Percheron-character at Erdőcsokona (1862); an originally muraközi × Belgian cross at Kaposvár (1894); a pure-bred Belgian at Németlad (1906); a muraközi × Belgian at Balatonbozsók (1910); a stud-farm of similar character at Alsószilvágy (1910); and an Ardennes × Percheron breeding stock at Karácsond (1914).

In the popular stocks of Hungary two main draught-horse types: the "pinkafői" and the "muraközi" developed in the inter-war period.

The heavier "pinkafői" horse evolved under the influence of the Belgian horse and the mixed type Belgian × warm-blooded horses of the region of the rivers Dráva and Mura, mainly on the areas of Sopron and Vas Counties. This type

Table 50. Horses in farms (1935, in per cent)

	Warm-blooded		Draught-type		Total	
	below	above	below	above	below	above
	100 cad. yoke (57·5 ha)					
Transdanubia	80·5	19·5	82·1	17·9	81·3	18·7
Great Hungarian Plain	86·4	13·6	76·8	23·2	85·6	14·4
Northern Hungary	89·4	10·6	58·2	41·8	87·0	13·0
National average	85·1	14·9	80·7	19·3	84·0	16·0

could not, however, become a true landrace. The "pinkafői" horse later became similar in character partly to the Belgian, partly to the mixed-type Belgian × warm-blooded horses, and lost its original characteristic features. The last specimens of the true "pinkafői" type could, however, be encountered in Sopron County as late as in 1940, on the occasion of enlisting horses for military purposes.

The lighter type, Styrian and Carinthian "muraközi" can be decidedly regarded as a landrace.

In the south-western part of Transdanubia the peasants, having earlier – in the last century – mated nori character mares with Arab, Spanish, Neapolitan and even English stallions, obtained a mixed-type stock for which later they used mainly Pinzgau, Oberland and Percheron – and occasionally English halfbred – stallions.

In the landrace thus developed, two types are generally distinguished: the small and the large "muraközi".

The small "muraközi" displayed the ancient Hungarian character too; these animals were – in spite of their Belgian draught-horse origin – brisk, enduring, tough, reliable, placid and rather unpretentious. This landrace, or at least its smaller, lighter variety was, in fact, of mixed-type; it is to this that its good qualities can be traced.

The large "muraközi" – in the inter-war period – had essentially more Belgian blood and was thus much more of a draught type; to my judgement it was hardly a separate breed, rather more a "lighter" variation of the Belgian draught-horse. Its characteristic features sooner resembled those of Percheron and Ardennes type horses.

A new "breed", a mixed-type crossed horse having appeared in the inter-war period has to be mentioned separately. It was the progeny of warm-blooded mares mated with draught-type stallions, that is, the first generation from crossing light and heavy breeds. According to *H. Döhrmann*'s opinion "the first products of this crossing sometimes resemble very heavy halfbred horses, sometimes appear to be poor structured draught-horses; they are lighter and brisker than the draught-horses wherefore some farmers like them, but their breeding value – if they have one at all – is, naturally, unreliable"(237).

The appearance of the mixed-type light × heavy horses caused great consternation, or at least dislike in the ranks of hyppologists, and mainly to the authentic (military) sphere, and was qualified – even if not officially – as a "defect from birth"(238).

This unsympathetic attitude did not ease in that period in spite of the fact that the favourable properties of these mixed-type horses were widely confirmed by practice. The unsuitability for reproduction of such horses was, of course, generally agreed on.

On the basis of my own experiences, in the farm under my management I had the English halfbred draught-mares true to breed covered by stallions of the same breed; the characterless ones by Ardennes stallions; and the mixed-type light × heavy mares by jackasses, with the best results in all three combinations. In this

context I should like to express my opinion that in agriculture – especially in drawing horse rails – mules proved excellent. In Bihar County e.g., in 1936 the Hungarian Land Corporation changed over to raising almost exclusively mules (239). On the Kohner estates in Szolnok County – where I was an assistant – the horse rails were drawn by mules.

It was not, thus, wholly justifiable that in Hungary, owing to a mere bias the use of mules was not widely introduced, although some were of the opinion at that time that as far as military aspects were concerned, the mule was the draught-animal of the future(240).

It must also be noted here that, while *B. Plósz*, leader of contemporary horse breeding, established in 1926 the national breeding districts, the latter were not much taken into account(241). The area of the country was then divided into five districts according to the actual situation: the districts of English halfbreds, Nonius, Lippizan, gidrán and draught-horses, respectively.

According to a survey made in 1935 the horse stock of Hungary showed the following percentage distribution:

English thoroughbred	0·2
Nonius	12·5
English halfbred	3·8
Arab	2·2
Lippizan	1·7
Other light type	59·1
Heavy type	20·5
Total	100·0

(It must be noted here that the list only includes the horses of landowners, for only these were registered at that time.)

These statistics hardly say anything. Namely, the nearly 60 per cent column of "other" obscures the proportions of breeds. One thing is, however, beyond question: the horses placed in the column "heavy type" were heavy horses, that is, either Belgian draught-horses, or at least mixed-type light × heavy ones.

Of the racing-horses we have spoken so far – though only indirectly – about the English thoroughbreds, exclusively from the aspect of the role they played in the horse breeding of Hungary in the inter-war period. The race-course itself has not been analysed. The same applies to the other type of racing-horses: the American trotter. This breed was not even patronized by the contemporary official organs on the plea that this branch of horse breeding was not in want of any support by the state as it was able to prosper unaided. Namely, after the First World War a fairly large number of private stud-farms were engaged in breeding quickly trotting halfbred cart-horses by using trotting stallions.

My own results have also confirmed the general experience that the thoroughbred trotter proved to be excellent as a running horse in jukker, officers' and supervisory carriages.

Speaking of horse-races, we must not leave unmentioned the draught-horse races held in that period (1925) in order to test the working capacity of draught-horses(242).

"The question of testing the draught-horses in a proper way, abroad, is a subject of continuous discussions"—wrote *S. Konkoly-Thege* at that time—"but no satisfactory method has been found so far. Full recognition is, therefore, due to *B. Gaál*, prominent and enthusiastic Director of the Tattersal show-ring, for having elaborated the regulation of draught-horse races"(243).

The race took place at the Budapest Tattersal and Show-Ring with great success(244).

Finally, I should like to say a few words about the meat production of horses. In the inter-war period some 20–25 thousand horses were slaughtered a year in Hungary for the purpose of meat production. The number of slaughter horses was 5000 in 1920, 16 000 in 1925, 24 000 in 1930 (the maximum was 29 000 in 1929), while in 1935 it fell again to 15 000. According to statistical data the annual number of slaughtered horses was roughly the same as that of bulls. Horse-meat was, thus, not qualified a "by-product" even at that time, though rearing for this purpose was out of question; it was confined, at most, to the activity of the horse-dealer who fed up the emaciated cast horses before selling them. In the horse-meat processing plant of Budapest the horses suitable for this purpose were decidedly fattened up.

Poultry breeding

When discussing the question of breed for poultry farming in Hungary we have to begin with separating the groups of gallinaceans, geese, ducks, turkeys and other fowl, since the ancient form and the subsequent changes in the individual breeds, and finally the development of Hungarian breeds completed in the inter-war period were different in the mentioned groups.

Gallinacea

In this group, the ancient Hungarian dunghill hen was obviously the basis, which is supposed to have developed from crossings between the gallinaceans of the Carpathian Basin and the ancient breed carried along by the first Magyar settlers of Hungary. The dunghill hens of the Avar age—restored on the basis of osseous remains–were small-bodied thin-boned animals(245). The bantam-like, red-brown feathered Hungarian hen—originating from the ancient home according to *Hankó*(246)—is supposed to have been crossed with these breeds. The small, hardy, clever and unpretentious Hungarian dunghill hen thus developed later increased in size (14th century) to a considerable extent(247).

In the period of changes taking place in the breeds, at the time of the Turkish wars, crossings with eastern breeds further increased the body size of the Hungarian dunghill hen. Among the other breeds of foreign origin the first to be men-

tioned was the cochin, a breed of Asian origin; in the middle of the 19th century it was reared in many places of Hungary, and the propensity for breeding as well as the special colour of a later type, the improved yellow hen, is supposed to have originated from this breed. In a chronological order the "brahma" breed imported from America should be mentioned next, but owing to its unfavourable properties (pretentious character, clumsiness) this breed soon disappeared from the practice of poultry farming in Hungary(248). The next breed, the Plymouth, imported in 1880 gained, on the other hand, a great importance(249). This relatively rapidly spreading breed had later a local variation, the "Hungarian Plymouth" evolved by Mrs. *L. Ordódy*. The origin of the Hungarian speckled hen, a breed resembling the Plymouth, has not reliably been cleared up, but it seems highly probable that at the turn of the century in most stocks called speckled Plymouth, crosses were present. These speckled varieties were types of larger body than the original Hungarian dunghill hen, but produced less eggs; they won the farmers' liking with their highly attractive appearance making them easy to distinguish from other hens.

It was at the turn of the late 19th early 20th centuries that the Orpington appeared in Hungary. The yellow variety of this breed, with its high egg production and outstanding resistance, initially spread relatively quickly, only to disappear later with the same rapidity, or merge into the similar colour variety of improved Hungarian breeds, hardly leaving a trace.

The Rhode Island and Leghorn breeds gaining later a much greater importance than the so far mentioned breeds in Hungary were imported and spread only in the inter-war period.

According to the general opinion of the period just discussed, of the two latter breeds the excellent layer Leghorn was less successful, partly because its eggs were lime-coloured with a very pale yolk, and partly because its lean, bluish meat was not much liked. The Rhode Island was a greater success, for this breed – while more exacting – produced brownish eggs, had a larger body and excellent meat, and – above all – its crosses with local Hungarian hens gave favourable results. The spreading of the Rhode Island was greatly promoted by the so-called cock exchange campaigns, during which cocks mostly of this breed were distributed.

Among the breeds of foreign origin a minor role was played by the Langshan, the Wyendotte, the Hampshire, etc.

The consolidation of breeds came about with the evolvement and general introduction of the Hungarian improved hen. It is at the same time with this process that the development of breeds in Hungary can be more or less demonstrated.

The so-called improved Hungarian hen had three variations: speckled, yellow and white. The partridge-coloured and Transylvanian naked-neck types also belong here.

The rather close inbreeding of the speckled type of the improved Hungarian hen began at the end of the 19th century after a purposeful and very strict selection (*J. Szalay* 1890 and *K. Röszler* 1897). It was only later that the Plymouth blood was introduced.

The vellow type was initially bred similarly in pure lines (*G. Hauer* 1896), but later it was crossed with Orpington.

The breeding of the white type started at the turn of the century also in pure lines *(B. Hauer, M. Polonyi, F. Hreblay)*. Later in the crosses the white Leghorn had some part.

The true-breeding of the partridge-coloured improved Hungarian hen began in the early 20th century *(L. Pákozdy)*.

Among the Hungarian gallinaceae the various coloured (speckled, yellow, white, black) Transylvanian naked-neck, a variation of the feathered-neck Hungarian hen, has to be mentioned separately. Its breeding started as early as in the 19th century (*L. Szeremlei* 1875).

The common advantages of the above mentioned types of the improved Hungarian hen – surpassing all advantages of any other breed – were: hardiness, unpretentiousness and cleverness, inherited from the ancient Hungarian dunghill hen. In the inter-war period the opinion still held strong that the Hungarian dunghill hen was a rapidly developing, resistant breed with excellent meat, but its body was too small, and produced small eggs with white and very brittle egg-shell(250).

The outer appearance of the Hungarian dunghill hen is composed of the following features: large, simply dentate comb; red cheeks; long, thin, fine, red throat-lobe, tiny red ear-lobe; straight back; strong tail feathers; wide convex breast; full belly; thin, relatively short, white, sometimes yellow or slate-grey legs with naked big toe(251).

In spite of the fact that in the inter-war period more than 90 per cent of the poultry stock of Hungary were maintained around the houses of small farmers, dwarf holders, manorial employees and other village people, that is, lived rather far from and inaccessible for any central guidance, the question of breed was a subject of contention, and occasionally stormy debates. These debates divided the Hungarian poultry breeders into two camps already at the turn of the century. In one were those who backed up the ancient Hungarian breeds, while in the other those who were all for rearing breeds of foreign origin. The fight later subsided, and the opposed views were synthetized in the decision of the Ministry of Agriculture to cross the Hungarian dunghill hens with larger foreign breeds laying brownish eggs, instead of breeding them in pure line *(B. Tormay)*. To promote this tendency of breeding white and yellow Orpington as well as speckled Plymouth and black Langshan cocks were initially distributed. In the inter-war period mainly Rhode Island cocks were distributed, in accordance with the unanimous opinion and desire of the breeders. All this very efficiently influenced the development trend of the Hungarian hen breeds.

According to *B. Báldy* the true-breeding and pedigree selection of Hungarian gallinacean breeds, and the propagation of selected lines superior to the former ones were started again at the beginning of the thirties(252). This activity was initiated, directed, organized and promoted partly by the state-owned poultry-farm at Gödöllő, partly by the National Association of Hungarian Poultry Breeders, and partly by the National Council for Poultry Breeding.

In those days the increasing influence of a central management achieved that in Transdanubia the yellow, in the Danube–Tisza Interfluve and east of the river Tisza the white, while in the northern part of Hungary the speckled type became dominant(253). In the inter-war period the question of breed was also influenced by the increasing number of poultry-farms and the establishment of poultry fattening plants of industrial character, since they generally reared identical breeds. The Hungarian improved hen developing in that period into a separate breed was reared in three colour variations (white, yellow, speckled). This medium large breed became popular with its hardiness, resistance and briskness.

Geese

In agreement with the usual pattern, goose breeding in Hungary was based on the ancient Hungarian common goose whose origin can be traced back to the wet groves of the Great Hungarian Plain, where the young of the wild goose were removed from the nests and raised in the poultry yards of village houses. The wings of fully developed geese were naturally cut back whereby they could be domesticated. The ancient Hungarian common goose thus shaped had originally greyish feathers, and only later, when supposedly crossed with the lighter colour Roman goose, and after the selection of lighter-coloured specimens became mostly white. The geese of Hungarian origin were, otherwise, known in three types: grey, white and frizzy feathered(254).

In the development of breed, foreign breeds played a role of varying importance in Hungarian goose breeding as well. Of them mainly the Toulouse and Emden geese were significant.

The development of breed was completed with the evolvement of the so-called improved Hungarian goose. This type had a body weight of 5–6 kg, was hardy, provided a tasty meat, and in its lines selected for this purpose produced a sufficient number of eggs.

Ducks

The ducks – like the geese – originated from the Carpathian variation of the wild duck. Its domesticated type, the ancient Hungarian common duck, was crossed during the 17th century with large-bodied Turkish ducks and thus improved to a considerable extent. The Hungarian variations thus developed were later crossed with Chinese, Peking ducks.

As a result of all this in the inter-war period mainly the Peking duck and its crosses were reared in Hungary. The breed called Hungarian duck at that time was a various coloured type of small size and sufficient resistance, easy to fatten, providing an excellent quality meat, but producing few eggs.

Turkey

In the case of turkey breeding – unlike the former cases – there was no such ancient type that could be regarded as the starting point of development. Namely, it was only in the 16th century that the turkey was introduced into Hungary. It was first described in 1691(255).

In the inter-war period beside the black and white Mexican types, generally called Hungarian turkey, mainly the so-called bronze turkey was reared.

Other fowls

Domestic fowls not discussed so far that can be placed in this group are: guinea-fowl, pheasant, pigeon and peafowl, of which only the guinea-fowl, and perhaps the pheasant are of agricultural importance.

The wild ancestor of the guinea-fowl – to our knowledge – lived in the Carpathian basin already in the Iron Age(256). In spite of this fact the domestic guinea-fowl reared in Hungary in the inter-war period was of foreign origin, of which a grey-coloured type was generally maintained.

The pheasant is only worth mentioning because its sterile bastards originating from crossing with Rhode Island were once (1930 Eszterháza) efficiently used for meat production.

Notes

(1) The present Hungarian spotted cattle was originally — even in the inter-war period — called Hungarian red spotted.
(2) S. Konkoly-Thege: Állattenyésztésünk fejlődésének irányai, eszközei és eredményei (Trends, means and results of development in the livestock breeding of Hungary). Budapest, 1948, 42.
(3) Köztelek 1917: 1268.
(4) Köztelek 1919: 272.
(5) Köztelek 1926: 409.
(6) G. Pazár. Köztelek 1925: 792.
(7) S. Konkoly-Thege: op. cit. 92.
(8) National Archives: K 184–10: 50616.
(9) Idem.
(10) Report of the National Chamber of Agriculture 1935: 82.
(11) Agrártörténeti Szemle, 1971, 1–2: 101–102.
(12) National Archives: K 184: 8718.
(13) Köztelek, 1938: 3.
(14) Agrártörténeti Szemle, 1971, 1–2: 98–101.
(15) Magyar Gazdaságtörténeti Szemle, 1903: 284–285.
(16) I. Cselkó: Szarvasmarhatenyésztés (Cattle breeding). Budapest, 1908, 52.
(17) O. Wellmann: A szarvasmarhák bírálata és törzskönyvezése (Evaluation and herd-book registration of cattle). 1926: 23.
(18) A. Horn: Általános állattenyésztés (Livestock breeding). Budapest, 1955: 232–235.
(19) H. Ditz: op. cit. 259.

(20) B. Hankó: A magyar háziállatok története (History of domesticated animals in Hungary). Budapest, 1954: 46, 54.
(21) G. Bocsor: A magyar tarka marha (The Hungarian spotted cattle). Budapest, 1960: 55.
(22) Magyarország Állattenyésztése (Livestock breeding in Hungary). 1926, I: 24–26.
(23) G. Bocsor: op. cit. 61.
(24) Magyar Állattenyésztés (Livestock farming in Hungary), 1940: 358.
(25) Köztelek, 1925: 729.
(26) National Archives: K 184–10: 8718, 8719.
(27) National Archives: K 184–10: 34439.
(28) National Archives: K 184–10: 42101.
(29) Magyarország Állattenyésztése (Livestock farming in Hungary), 1926: I: 28–31.
(30) National Archives: K 184, a/41: 8718.
(31) Idem.
(32) Magyar Állattenyésztés (Hungarian livestock farming), 1940: 340–360.
(33) Köztelek, 1921: 895.
(34) Köztelek, 1929: 1536.
(35) Deutsche Landw. Tierzucht, 1926: No. 22.
(36) Köztelek, 1921: 513–514.
(37) A. Horn: Újabb irányelvek a szarvasmarhatenyésztésben (New tendencies in cattle breeding). Budapest, 1942: 141.
(38) Ibid. 148.
(39) Köztelek, 1922: 280.
(40) Ibid.
(41) "Let us reject the theory, or rather prejudice"—wrote the contemporary breeder (A. Tóth)—"and admit at last that the Hungarian spotted cattle is just as much a three-purpose breed as the over-propagated Simmenthal" (Köztelek, 1935: 727).
(42) Állattenyésztők Lapja, 1924: 8.
(43) Köztelek, 1943: 38.
(44) A. Horn: op. cit. 147.
(45) On the basis of contemporary reports of the National Agricultural Exhibition and Cattle-Show.
(46) O. Wellmann: 1940: 19.
(47) J. Schandl: A szarvasmarha tenyésztése (Cattle breeding). Budapest, 1962: 105.
(48) Köztelek, 1922: 191.
(49) Köztelek, 1919: 374.
(50) Köztelek, 1919: 275.
(51) L. Gaál: op. cit. 406.
(52) Magyarország Földművelése 1896: 168.
(53) Állattenyésztők Lapja, 1928: 347–348.
(54) One of the farms of the former Kohner estate in Szolnok County.
(55) Köztelek, 1922: 507–508.
(56) P. Battha: Szarvasmarhatenyésztésünk újabb eredményei az elit-törzskönyvben (Recent results of cattle-breeding in Hungary in the elite herd-book). Budapest, 1936: 10.
(57) Köztelek, 1933: 593.
(58) S. Konkoly-Thege: op. cit. 194.
(59) S. Konkoly-Thege: A világverseny és mezőgazdaságunk jövője (The world competition and the future of agriculture in Hungary). Budapest, 1924: 92.
(60) O. Wellmann: 1940: 6.
(61) They are: Alemann, Algau, Lower-Rhine, Angeln, Ansbach, Ayrshire, Bern, Bern-Holland, Pecheneg, Bonyhád, various local badger-coloured cattle types, Busa, Charolais, Csira, Dux, Flemish, Frank, Freiburg, Frizland, Galician, Gorál, Hungarian mountain cattle, Hereford, Holland, Hucul, Hun, Innthal, Jersey, Keilhaim, East-Frisian (Ostfriesland), Small-Carpathian, Krassó-Szörény County, Kuhland, Lowland, Polish brown, Polish gori, Polish red-spotted, Limburg, Hungarian Tran-

sylvanian, Grey Hungarian, Hungarian spotted, makács, Mariahof, mokány, Moldavian, Montafon, Moravian, Möllthal, Mözs, Murnau, Mürtzthal, German grey, German peat, Oberinnthal, Oberlabd, Pinzgau, red-spotted lowland, Hungarian red-spotted, red-spotted of Ipoly region, red-spotted of Mosonsopron, Podolian, Polder, Pozsony–Nyitra, Pusterthal, riska, Romanian, Salzburg, Shorthorn, Stayr, Szepes, Simmenthal, Slavic, Tyrolean (tirolisi), Triesdorf, red cattle of Vas County, Vogelsberg, Wilstermarsch, Zillerthal (L. Gaál: op. cit. 539–540).

(62) Magyarország Földművelése, 1896: 161.

(63) Állattenyésztők Lapja, 1928: 348.

(64) Magyarország Állattenyésztése, 1926: I: 32.

(65) Állattenyésztők Lapja, 1928: 348.

(66) G. Bocsor: op. cit. 64–65.

(67) L. Gaál: op. cit. 45.

(68) Besides the Hungarian Hortobágy racka other racka breeds were also reared in the Carpathian Basin, mainly the so-called Transylvanian racka which was identical with the Romanian pursa sheep *(Ovis aries strepsiceros dacicus)*. This breed was not brought along by the conquering Hungarians; it came much later from the Balkans to Transylvania. In this sheep breed the horns of the rams—notwithstanding their name (strapsiceros)—were of elongated spiral shape, though rams with crescent-shaped horns, and even hornless rams occurred as well. The ewes were mostly hornless. This breed was crossed later with the above mentioned ancient Hungarian racka to produce the Hungarian Moldavian sheep (Ovis aries strepsiceros hungaricus), in which the pursa blood appeared in the smaller angle of the V-shaped horn. As a result of crossing the tip of the horns became flat. Only the pure-bred ancient Hungarian racka of Hortobágy has horn tips of circular cross-section, all the other racka types have flat horn tips (L. Gaál: op. cit. 45–46).

(69) Magyar Állattenyésztés, 1940: No. 22–23.

(70) Köztelek, 1925: 826.

(71) L. Gaál: Törzskönyvezési útmutató (Guide for herd-book registration). IV. Budapest, 1955: 84–86.

(72) To avoid any misunderstanding, a number of sheep breeds lived even earlier in the Carpathian Basin. As early as in the 16th–17th centuries at least eight breeds could be clearly distinguished. In the correspondence and orders of G. Rákóczi I., Prince of Transylvania, e.g. the ancient Hungarian racka, the Transylvanian racka (pursa), the flat-tailed sheep (karakul), as well as the Wallachian and Moravian sheep are clearly mentioned. According to other sources, beyond the breeds mentioned by Rákóczi some local types of the Central-European common sheep, an ancient Hungarian non-racka breed, and another breed called then "bayka"—which has not reliably been identified so far—were also reared in those days (L. Gaál: op. cit. 188–189).

(73) M. Rácz: Magyarország juhtenyésztése (Sheep breeding in Hungary). Budapest, 1914.

(74) National Archives: 184–10: 35693.

(75) J. Rodiczky: Adatok a magyar mezőgazdaság történetéhez (Contribution to the history of agriculture in Hungary). Magyaróvár, 1880: 8, and A juh és a gyapjú ismertetése (Description of the sheep and the wool). Budapest, 1892: 17.

(76) L. Gaál: op. cit. 294.

(77) Köztelek, 1941: 559.

(78) J. Rodiczky: Adatok a magyar mezőgazdaság történetéhez

(79) J. Nagyváthy: A szorgalmatos mezei-gazda (The industrious farmer). Pest, 1791: 261.

(80) I. Acsády: A magyar jobbágyság története (The history of serfdom in Hungary). Budapest, 1944: 403.

(81) Sheep breeds proved to have been raised on the territory of Hungary in the Carpathian Basin were: Balkan, bayka, Bergamo, berke, birszán, Bomehica, Boldenbuck, brezán, cakali, cigája, cikta, cotswold, Bohemian common sheep, Dishley, down, dutja, electoral, escurial, electoral-negretti, Transylvanian (white, black, black-grey), French,

Frisian, Wallachia, meat-type merino, karakul, eastern domesticated sheep, fine-wooled of Asia Minor, Tartar, Central-European common sheep, lápi, Lincoln, Macedonian, merino precoce, micza, mimus, misztrigánka, Moravian, negretti, German meat-type merino, German common, Oxfordshiredown, ancient Hungarian nonracka, parnája, pursa, racka (Balkan, Transylvanian, white of Hajdúság, of Hortobágy, Romanian), Rambouillet, copper, Roman, Saisonnais, soroki, Southdown, Stagos, Svabian, Sicilian, Stogu, Turkish peat, Volachica, Vlach, Würtemberg, Zaupel, fat-tailed folded sheep (L. Gaál: op. cit. 537).

(82) J. Schandl: Juhtenyésztés (Sheep breeding). Budapest, 1966: 63.
(83) Magyarország Állattenyésztése, 1926: 34.
(84) L. Gaál: Törzskönyvezési útmutató (Guide for herd-book registration). IV: 27–30.
(85) To be able to form an opinion of the contemporary situation we have to know that the wool was an agricultural product relatively easy to sell, though at extremely reduced prices. The Hungarian farmers and sheep breeders suffering from a shortage of money during the economic crisis, in spring—the worst period of the economic year—could get cash money for the wool. Sometimes even earlier, in the form of advance money. So it is not surprising that the development of breeds was adjusted to the demands of the textile industry.
(86) Köztelek, 1925: 47.
(87) Magyarország Állattenyésztése, 1926: IV: 21 and 30–31.
(88) J. Schandl: Juhtenyésztés. 1966: 60.
(89) Magyarország Állattenyésztése, 1926: IV: 25.
(90) Köztelek, 1925: 615.
(91) Köztelek, 1921: 191.
(92) Köztelek, 1921: 396.
(93) Köztelek, 1922: 340–341.
(94) Köztelek, 1926: 6.
(95) Köztelek, 1926: 6.
(96) Magyarország Állattenyésztése, 1926: IV: 26.
(97) Köztelek, 1926: 606.
(98) Állattenyésztők Lapja, 1927: 207.
(99) Magyar Állattenyésztés, 1939: 14.
(100) Köztelek, 1936: 306.
(101) J. Schandl: Juhtenyésztés. 60–63.
(102) Országos Mezőgazdasági Kamara jelentése (Report of the National Chamber of Agriculture). 1933: 80.
(103) L. Gaál: op. cit. 189.
(104) L. Gaál: A juhtej (Ewe-milk). Budapest, 1957: 63–64.
(105) A. Horn: Általános állattenyésztés 1955: 55.
(106) Just a few words about the mentioned breeds:
The "szalontai" breed (red pig, ugrai breed) was of conspicuously large body, hardy, mostly of meat-type, with reddish-yellow, rather straight hair, providing a tough but very tasty meat and bacon.
The "bakonyi" was a dun-fair coloured, short-bodied, thick-boned, mainly lard-type breed with erect ears, providing a tough meat and thick lard. In the 18th century it was still bred in pure line (Grassalkovich estate).
The "siska" pig can no longer be described. It was of Croatian origin supposedly derived from the domesticated North-European wild pig.
The "turmezei" pig was probably an old Hungarian breed produced by crossing with the Balkan wild pig.
The lowland pig, a descendant of the Avar domesticated pig, was a small bodied, mostly lard-type animal.
The meadow pig was a later developed, mostly meat-type breed originating from the "szalontai" pig run wild, or from crossings with the wild pigs of the south-eastern regions.

The Polish pig was a medium size, fertile and hardy, mostly meat-type breed. In Hungary it was reared in a "small-eared" variation.

The Syrmian pig was a large-bodied, slate-grey, often black, thinly bristled breed evolved between the rivers Drava and Sava.

(107) When in the Bakony Mountain the acorn-crop was poor, and pigs of good condition could not be purchased in this region, the old pig-dealers of Sopron and Győr were compelled to go farther to the South. While the black pigs beyond the Drava did not win their approval, they were highly satisfied with the Serbian pigs across the river Sava. However, since trade with these pigs was the monopoly of the Serbian reigning dynasty, the dealers could only get animals of poorer quality, which they partly sold as lean pigs in Sopron, partly fed up while driving them along the Danube to Győr. The third route was along the eastern side of the Danube up to Pest. The pigs driven toward Győr were seen in a bettered condition around Bicske–Alcsut by Joseph, Palatine of Hungary, who took a fancy to these animals and decided to establish such a "sumadia" farm on his estate at Kisjenő. He sent M. Pfeiffer pig-dealer to Serbia. When Prince Milos learned from him the name of his consigner, selected nine sows and two first-class boars and sent them as a present to the Palatine. This small breeding stock was the basis of the Kisjenő pig-farm. Later this farm supplied a large part of the Hungarian mangalica breeders with breeding material. Up to the end of the century 6 014 sows and 2 774 boars were distributed from this farm all over the country for breeding purposes (L. Gaál: op. cit. 316).

(108) B. Dorner described the breed in 1925.

(109) Állattenyésztési Enciklopédia Budapest, 1959: 56.

(110) National Archives: L 184–10: 8718.

(111) Köztelek, 1928: 733.

(112) It must be noted here that according to a verbal information by F. Kertész the "bázna" pig was not of Berkshire, but of Essex origin.

(113) Állattenyésztési Enciklopédia 1959: III: 58.

(114) Köztelek, 1943: 283–284.

(115) B. Dorner: A sertés tenyésztése és hízlalása (Pig breeding and fattening). Budapest, 1925: 10.

(116) National Archives: K 184–10: 50616.

(117) A Transdanubian estate in Vas County, along the river Rába.

(118) B. Dorner: op. cit. 112.

(119) Magyarország Állattenyésztése, 1926: III: 32.

(120) Állattenyésztési Enciklopédia 1959: III: 53.

(121) Magyarország Állattenyésztése 1926: III: 22–26.

(122) National Archives: K 184–10: 8719.

(123) Idem. K 184–10: 25084.

(124) Idem. K 184–10: 8719.

(125) Idem. K 184–10: 50616.

(126) Idem.

(127) Magyarország Állattenyésztése, 1926: III: 23 and 208.

(128) Állattenyésztők Lapja, 1926: 107.

(129) Állattenyésztők Lapja, 1927: 292.

(130) Köztelek, 1938: 733.

(131) B. Dorner: op. cit. 143.

(132) Köztelek, 1923: 1047–1048.

(133) B. Dorner: op. cit. 114.

(134) All three of them in Transdanubia.

(135) Konkoly–Pöhl: I. Beszámoló a Szelényi (Lajos)-féle tangazdaságban végzett kísérletekről (First report on the experiments carried on in the model farm of L. Szelényi). Budapest, 1929, Pátria.

(136) Köztelek, 1927: 341.
(137) B. Dorner: op. cit. 113.
(138) Köztelek, 1928: 1946.
(139) B. Dorner: op. cit. 112.
(140) Állattenyésztési Enciklopédia, 1959: III: 66.
(141) B. Dorner: op. cit. 121.
(142) One of the farms of the entailed estate of the Esterházy Princes in Sopron County.
(143) Országos Mezőgazdasági Kamara jelentése 1944: 83.
(144) B. Dorner: op. cit. 121.
(145) Köztelek, 1942: 767.
(146) Állattenyésztők Lapja, 1927: 178.
(147) Köztelek, 1924: 2.
(148) In Western Hungary.
(149) Állattenyésztők Lapja, 1928: 153.
(150) L. Korizmics: Gazdasági levelek (Letters on farming), Pest, 1867: 183–184.
(151) E. Éber: A magyar állattenyésztés fejlődése (Development of livestock farming in Hungary). Budapest, 1961: 339.
(152) Magyarország Állattenyésztése, 1926: III: 24.
(153) Állattenyésztési Enciklopédia, 1959: III: 53.
(154) E. Éber: op. cit. 344.
(155) Magyarország Állattenyésztése, 1926: III: 25.
(156) National Archives: K 184–10: 8719.
(157) Idem. K 184–10: 5665.
(158) Idem. K 184–10: 8719.
(159) Idem. K 184–10: 77299.
(160) Idem. K 184–10: 8719.
(161) Idem. K 184–10: 1718.
(162) Idem. K 184–10: 8718.
(163) Idem. K 184–10: 25082.
(164) Idem. K 184–10: 8718.
(165) Idem. K 184–10: 113413.
(166) Köztelek, 1921: 344.
(167) Köztelek, 1921: 377.
(168) Köztelek, 1924: 2.
(169) National Archives: K 184–10: 1819.
(170) Köztelek, 1927: 1883.
(171) National Archives: K 184–10: 1719.
(172) Köztelek, 1930: 632.
(173) Köztelek, 1931: 181.
(174) Köztelek, 1930: 498.
(175) National Archives: K 184–10: 18718.
(176) Idem.
(177) Köztelek, 1932: 262.
(178) Köztelek, 1924: 1208–1209.
(179) Országos Mezőgazdasági Kamara jelentése, 1938: 86.
(180) M. Szuhay: op. cit. 29.
(181) Köztelek, 1925: 614.
(182) Köztelek, 1924: 1066.
(183) Köztelek, 1924: 1067.
(184) A. Kiss: Mezőgazdaságunk fejlődése (Development of agriculture in Hungary). Budapest, 1944: 57.
(185) National Archives: K 184–10: 51378.
(186) Köztelek, 1941: 491–493.
(187) B. Dorner: op. cit. 144.

(188) Magyarország Állattenyésztése, 1926: III: 31.
(189) E. Éber: op. cit. 426, 466.
(190) Állattenyésztési Enciklopédia 1959: III: 53–54.
(191) The most important works of them written by Hungarian authors are: C. Anghy: Die Taki-Tarpan Abstammung des ungarischen Pferdes. Vertebrata Hungarica 1959. —E. Éber: A magyar állattenyésztés fejlődése (Development of livestock farming in Hungary). Budapest, 1961. —L. Gaál: A magyar állattenyésztés múltja (The past of livestock farming in Hungary. Budapest, 1966. B. Hankó: A magyar ló eredete (The origin of the Hungarian horse). Debrecen. —M. Jankovich: Pferde, Reiter, Völkerstürme, München, Land Bayerischer Landwirtschaftverl.—M. Jankovich: A magyar ló (The Hungarian horse). Agrártörténeti Szemle, 1970. No. 3–4. Budapest.
(192) I. Széchenyi: Lovakrul (On horses). Pest, 1828: 219.
(193) H. Ditz: op. cit. 260.
(194) L. Korizmics: op. cit. 176–177.
(195) B. Kovácsy–K. Monostori: A ló és tenyésztése (Horse and its breeding). Budapest, 1905: 383.
(196) Idem.
(197) Magyarország Állattenyésztése, 1926: II: 27.
(198) Magyarország Állattenyésztése, 1926: II: 109.
(199) Állattenyésztési Enciklopédia, 1959: III: 208–219.
(200) Magyarország Állattenyésztése, 1926: II: 28.
(201) Idem.
(202) Köztelek, 1921: 416.
(203) H. Döhrmann: Köztelek, 1920: 480.
(204) Magyarország Állattenyésztése, 1926: II: 29.
(205) Állattenyésztési Enciklopédia, 1959: III: 218.
(206) Köztelek, 1916: 816.
(207) Köztelek, 1915: 236–237.
(208) Köztelek, 1916: 1745–1747.
(209) National Archives: K 184–10: 8719.
(210) A. Horn: Általános állattenyésztés 1955: 57.
(211) Állattenyésztési Enciklopédia, 1959: III: 207.
(212) J. Szigeti: A háziállatok korszerű szelekciója (Up-to-date selection of domesticated animals). Budapest, 1959: 66.
(213) Magyarország Állattenyésztése, 1926: II: 22.
(214) Magyarországi Állattenyésztése, 1926: II: 104.
(215) Köztelek, 1916: 1745–1747.
(216) Köztelek, 1917: 283.
(217) Magyarország Állattenyésztése, 1926: II: 21.
(218) Verbal information of S. Konkoly-Thege.
(219) Állattenyésztési Enciklopédia, 1959: III: 202.
(220) Köztelek, 1921: 346.
(221) E. Éber: op. cit. 475.
(222) Köztelek, 1920: 367.
(223) National Archives: K 184–10: 8718.
(224) Idem. K 184–10: 76528.
(225) Köztelek, 1926: 912.
(226) Köztelek, 1921: 1159.
(227) National Archives: K 184–10: 8718.
(228) Köztelek, 1928: 991–992, 1015–1016.
(229) E. Éber: op. cit. 470.
(230) Köztelek, 1942: 836.
(231) National Archives: K 184–10: 8719.
(232) Idem. K 184–10: 50616.

(233) Országos Magyar Gazdasági Egyesület jelentése, 1935: 50.
(234) Köztelek, 1943: 128–129.
(235) On the basis of data published by A. Kiss.
(236) Országos Mezőgazdasági Kamara jelentése, 1944: 81.
(237) Magyarország Állattenyésztése, 1926: II: 32.
(238) Állattenyésztési Enciklopédia, 1959: III: 220.
(239) National Archives: K 184–10: 30616.
(240) Köztelek, 1936: 436.
(241) Magyarország Állattenyésztése, 1926: 29.
(242) Köztelek, 1925: 71–72.
(243) Köztelek, 1925: 497.
(244) Állattenyésztők Lapja, 1925: 156–158.
(245) After statements and opinions of S. Bökönyi, B. Hankó, J. Matolcsi, Miss Z. Mártha.
(246) According to B. Hankó "the first Magyar settlers of Hungary brought along poultry too in the wickerwork body of their carts" (op. cit. 119).
(247) S. Bökönyi: A budai várpalota ásatásának állatcsontanyaga (Osseous remains of animals found in the excavations of the Buda Castle) II. Budapest régiségei XX: 412.
(248) Miss Z. Mártha: op. cit. 68.
(249) According to B. Hankó Plymouth cocks were already imported in the 1860's (op. cit. 120).
(250) K. Dévánszky: Az állattenyésztés állami támogatása (State support to livestock farming). Budapest, 1932: 15.
(251) Z. Csukás: A gazdasági baromfiak tenyésztése (Poultry breeding on farms). Budapest, 1935: 73.
(252) Trianoni Magyarország mezőgazdasága (Agriculture of Hungary after Trianon). Budapest, 1941: 573.
(253) Idem.
(254) B. Hankó: op. cit. 123.
(255) Z. Csukás: op. cit. 197.
(256) B. Hankó: op. cit. 118.

Chapter 17 Feeding

General Survey

The best way to study the question of livestock feeding is to consider it from the following aspects(i): the situation of meadows and pastures(ii); the trend of field cropping and(iii) the utilization of the available feedstuffs in Hungary in the inter-war period.

With respect to this period no matter which of the above aspects we choose to study first, a historical approach again seems to be the most appropriate.

Worth mentioning for example is the preparation of hay. Sources of the 9th and 10th centuries (*Leo VI, The Wise*, *Ibn Rusta*, *Bakri*, *Gardizi*, etc.) generally suggest that making hay was even then a well-known and widely used method of preserving fodders(1). The first Magyar settlers of Hungary stored dry grass to be used during incursions, wanderings, or in winter. These reserves mainly consisted of grass dried up standing in the field, and occasionally of grasses cut and dried. Grass was in either case collected, however, on a small scale only when occasion arose, rather than systematically. Feeding in winter – which required larger volumes of hay – was solved, even much later, by turning animals out to graze grass dried in the field. For about five centuries it was a general practice in the Carpathian Basin that pastures producing thicker stands with long-stalked grasses were not grazed up in summer, but the grass was left to dry in the field and fed off in winter, whereby the work of haymaking, stacking and apportionment – operations considered then insoluble – were spared. The deed of foundation of the Csatár Abbey originating from 1150 mentions haymaking when enumerating the services of the contemporary libertines. Again, according to a document from the 13th century haymaking was carried on in the Rába forest.

Haymaking later became a general practice, and from the 14th and 15th centuries sources mentioning haymaking are available in abundance(2). However, the earlier mentioned large-scale cattle exports of Hungary in the 15th and 16th centuries were based almost exclusively on the fresh, wet lowland pastures of those days rather than on hay. In those centuries even the pigs were mostly fed in the Carpathian Basin on the fish, bird's eggs, young plants of moors, fens and wet meadows, and acorn of forests. However, in the allodial management of the estates the by-products of mills (bran, tailings, siftings, mill-dust), breweries and distilleries (malt returns) and dairies (whey, cheese scraps) soon appeared as feedstuffs. In the 16th century there were already manors where "buckwheat, sorghum, in some places barley and millet were used to feed the animals with"(3).

In Hungary it was in the first place in the allodial livestock management that the role of feeding became more and more important and developed – accord-

ingly – parallel with the that of estate management(4). Instructions given by the landlords in the 16th and 17th centuries give a clear picture of the contemporary conditions of feeding. They prescribed the care of meadows and pastures, the control of weeds and the extension of grazing areas through the destruction of harmful bushes and shrubs. Expert instructions were given concerning the drainage of pastures and meadows. The generally known methods of haymaking – employed even today – can everywhere be found in them. They even gave the optimum size of the haystack. The fact that in these instructions the main emphasis was laid on the methods of preparing, storing and using up roughage shows that feeding was mainly built on this kind of feedstuff even in the manorial management. It is thus obvious that livestock farming at that time was almost exclusively based on grazing, and feeding rough fodders.

An extremely important step was the distinction of rough fodders according to quality by animal species as well as the separation of strong and weak animals; the latter suggesting the initiation of individual feeding. Besides the hay, straw, chaff and husks were also regarded as valuable supplementary feedstuffs. The employment of a separate person for feeding, an "authentic hay distributor", whose duties beyond the feeding of animals included the care of the haystacks too was prescribed. Mention was made of the utilization of hay wastes, that is, the finer parts of the roughage were recognized even then as being more valuable feedstuffs richer in nutrients. The outlines of feeding projections can be detected in the instructions made on saving the finer hay more suitable for feeding the sheep in a later period of winter feeding.

These manorial instructions covered the grain fodders too, and occasionally called attention to the maize (Turkey wheat) as well(5). At that time, spoiled bread-grain as a grain fodder played an important role. Namely, in those centuries thrashing lasted well into the winter, and the grain was mostly stored in underground pits. It is worth mentioning that even in those days horses were already fed almost exclusively on oats and hay.

Between the 14th and 18th centuries any quantitative and qualitative improvement in the feeding of farm animals – primarily in the growing of field fodders – spread slowly and with difficulty from the allodial estates to the peasant farms.

In the feeding system of Hungary a radical change was brought about by the appearance of field grown fodder crops, which again was mostly and primarily the merit of manorial farming.

While earlier no suitable Hungarian word had even been found for the concept of feeding – *Nagyváthy* used, for lack of a better, the term "grazing in stable"(6) – in the 18th century *S. Tessedik* already encouraged the peasants to sow alfalfa, clover, sainfoin. In the middle of the 19th century the Swiss cows of the Marczali estate were given "fresh alfalfa and Spanish clover in summer, and hay, potato and mangel-wurzel alternately in winter"(7). It was at the end of the 18th and beginning of the 19th century that artificial calf-rearing (1789) and the fermented preservation of green fodders (1805) were introduced into Hungary.

In the 19th century the increasing fodder crop growing was accompanied – even

if later and slowly – by developments in pasture and meadow management. The Magyaróvár estate e.g. trebled its hay yield between 1835 and 1845 by irrigating the meadows(8).

The abolition of serfdom (1848) meant an important step forward resulting – among others – in the efforts of peasant farms to adopt the practice and methods of manorial livestock feeding.

It was not only in the conditions of life of the peasantry that the emancipation of serfs brought about radical changes; it transformed the way of thinking, and above all the economic views of the peasants. Realizing his changed position the peasant farmer looked at his own land and cultivated it in a different way. Beyond his everyday bread he wanted to see at last other results of his work too. The people of the land were better motivated by their own interests than they had been before by the heyduck of the landlord. The practice of socage and tithe no longer existed, and everybody was allowed to profit by his abilities, talent and work thus gave an impetus to livestock farming and promoted the development of feeding.

The general progress made at the turn of the century was later checked and hindered by the consequences of the First World War. The theoretical development – the Hungarian study of feeding – was, however, able to move with the rising European level.

After the First World War the overall situation was in every respect very unfavourable. Neither the feed supply nor the spread of professional knowledge were sufficient to have confidence in the future of livestock farming and breeding in Hungary. So the unexpected development and unhoped surprising results bore eloquent testimony to a right policy of livestock farming and crop production sooner or later arousing interest in these activities.

The initiation of the mentioned sound tendency was mostly due to *S. Konkoly Thege*, who not only called attention to the basic importance of feeding, and discussed the relevant problems by analyses and explanatory methods, but at the same time made reasonable proposals on the solutions to prevent the damages threatening livestock farming in Hungary at that time(9). His theoretical and literary work was realized in practice through his educational and organizing activity.

In his judgement, the number and quality of the livestock of Hungary was adjusted to the unreasonably backward conditions of fodder growing without any attempt made to raise these conditions to the desired level of livestock farming(10). This was an important statement as it made the breeders realize that for centuries they had followed the wrong track and that they only could expect any progress when adjusting fodder production to livestock farming rather than acting the other way round. The author rightly pointed out that the dimensions of livestock farming had earlier been determined by the acreage and yield of fodder production rather than by the reasonable limit of profitability.

All these statements were made at the right time to give directives in a period when Hungary – pressed between the new borders – began to reorganize its eco-

nomic life. That was, namely, the period when the system of farming was getting more and more intensive, when the new conditions and new ideas brought about new intensive animal species (spotted milk-type cow, merino sheep, meat-type pig) suitable to them. And the new requirements of these animal species raised new demands especially on feeding. *S. Konkoly-Thege* hit the nail on the head by saying that without an improvement of the general situation of fodder production – and of the special conditions of certain regions and farms –, and elimination of faults in the system of feeding Hungarian livestock farming was unable to make any considerable progress(11).

Today these reflections seem to be quite natural, but it was not so at that time, especially before the First World War. There are written documents available disapproving of the propagation of the Hungarian red-spotted breed and speaking up for the maintenance of the Hungarian wild cattle giving the insufficient feed supply as the reason(12).

Konkoly's warnings and advice spread rapidly and the resulting changed view created a wide practice of subordinating feed production to livestock farming and determining its dimensions according to the demands of the livestock.

In all this the economic world crisis of the thirties also had a part by ruining the Hungarian cereal production. Moreover in a period when the Hungarian Prime Minister requested the farmers in a radio proclamation to produce as little wheat as possible, thereby the reduction of fodder areas was prevented and later they were even extended. A renewed interest in livestock farming and the development of the science of feeding and the extension of plant breeding to include fodder crops were contributing factors.

In the subsequent chapters the natural grass areas and the field growing of fodder crops will be discussed, to be able to evaluate their conditions and correlations correctly. We have to start out from the standpoint – formed otherwise in the course of analysing the statistical data – that "the ratio of natural grasslands to arable area can by no means be a basis for judging the fodder supply of a given area"(13).

Thus, when looking at the question from the point of view of livestock farming we cannot rightly conclude from the ratio of natural grasslands to arables as to the livestock supporting capacity, and thereby to the general situation of feeding.

The natural grasslands

The necessity – and with it the extent too – of growing of fodder crops, as well as the quantity and quality of fodders were primarily determined by the size and quality of natural grasslands. In Hungary feeding was mainly based on the yield of meadows and pastures. In spite of the fact that the decrease in size, and deterioration in quality of meadow and pasture areas clearly showed already at the turn of the century that the old system was no longer practicable, the deep-rooted

view of meadow and pasture being the basis of livestock farming was still held for a long time; even after the First World War not infrequently some traces were encountered. The fact that in the inter-war period nearly one-fifth of the total area of Hungary was covered by meadows and pastures (7·1 per cent meadow + 10·6 per cent pasture = 17·7 per cent) may give some explanation. The importance of the meadow area at that time (some 0·6 million ha) was shown by the fact that it was almost as large as the arable area sown to roughages (about 0·7 million ha).

The great change – here too – was brought about by the new situation caused by the Peace Treaty of Trianon. While on the total area of Hungary before 1918 0·34 ha meadow and 0·37 ha pasture fell to one standard animal, on the post-war territory of Hungary the corresponding figures were 0·22 and 0·33, respectively.

According to the relevant statistics the acreage of natural grasslands showed the following trend(14):

		Thousand ha	Total per cent
Meadow	1921 ca.	665·9	7·2
	1930	668·2	7·2
	1938	645·8	6·9
Pasture	1921	1012·2	10·9
	1930	1000·7	10·7
	1938	965·1	10·4

Although the decrease in the proportion of the natural grassland area was only 0·8 per cent, the total acreage of the meadow area became smaller by 20·1 ha and that of the pasture area by 25·9 ha compared to the 1921 conditions. The natural grasslands suffered thus a considerable loss (46·0 thousand ha). When expressing this decrease as a percentage of the total agricultural area we find the following trends(15):

	Meadow	Pasture	Total
		per cent	
1921	9·1	13·9	23·0
1930	9·1	13·8	22·9
1938	8·8	13·3	22·1

It was only in the thirties that the reduction of the natural grassland area became more considerable. Within the overall decrease the ratio of meadow to pasture changed in favour of pastures.

An analysis of the statistical data of 1935 reveals a negative correlation between the ratio of meadow and pasture areas to the development stages of livestock farming. In Transdanubia where livestock farming was carried on at a high level, hardly any pasture was found, while on the vast grazing lands of the Great Hungarian Plain the number of animals was relatively low. It was a commonplace in the inter-war period that the livestock put to pasture on the Hortobágy were run

down, and the starving animals often had to be carried off the pasture by cart. The same phenomenon is shown in the data relative to the distribution of meadows and pastures. The proportion of the meadow area was 6·9 per cent of the total agricultural area of Hungary in 1935; in Transdanubia the corresponding percentage was 8, while in the Great Hungarian Plain only 6·1%, and in the North 6·5%. With respect to the pastures it was the other way round; compared to the national 10·6 per cent the proportion of pastures was 12·2 per cent in the Great Hungarian Plain, and only 8·3 per cent in Transdanubia. The northern areas of the country again occupied a place between the two extremes, with 11·7 per cent.

Furthermore, the 1935 census provides an insight into the complex problem of farm structure on meadow and pasture areas. The farm organizational aspects of the question are complicated because smaller farms maintained their animals on the common pastures, whose area generally is not easy to determine from the statistical surveys. The smaller farms could hardly utilize their scattered grazing lands, as they only put one or two animals now and then to pasture, so the pastures owned by small farms were slowly transformed into arables. The meadows, however, were considered valuable lands even in the dwarf holdings. Therefore, while the pastures were mostly owned by large-scale farms, even when the common pastures are not taken into account, the overwhelming proportion of meadows was in the possession of peasant farms(16).

However, the quality of meadows and pastures seems to be a more important aspect than the acreage of natural grasslands.

When examining this question and evaluating the relevant data we must not overlook the fact that the quality of meadows and pastures in Hungary at that time, and accordingly their productivity as well, require quite different considerations than the similar grassland areas in North- and West-European countries, because due to the different conditions – mainly distribution – of precipitation the value of Hungarian grasslands was essentially lower.

According to the relevant data, on the present area of Hungary 47 per cent of the meadows was acidic, 31 per cent alkaline, that is most of them were very poor at that time. Again, 14 per cent of the pastures was sandy, 22 per cent alkaline, and 17 per cent of them was situated on mountain slopes. Only 10–15 per cent of the pastures were more or less planted with trees. About manuring, fertilization and irrigation of grasslands in those days, we can hardly say a word.

This discouraging picture does not agree with the statistical data based on naive estimates, namely, the following yields (in q/hectare) for meadow hay on the post-war territory of Hungary:

1925	24·3
1930	29·0
1935	20·0
1938	31·8

that is an average of 21 to 28 q per hectare.

I do not, however, think these data are realistic, partly because they overesti-

mated the quantity of the hay yield, partly because the quality of hay did not permit taking its feeding value as 100 per cent. Let me support this statement with *Konkoly-Thege*'s words(17) who wrote that the poor quality of hay presented even more difficulties than the low yield averages did. A considerable part of the Hungarian hay yield consisted of "acidic" grasses, horsetail, reed, bulrush, dry stalks of weeds that even the horse was unwilling to consume, and the cattle did not eat at all. It was not only that this hay was not tasteful, but also its feeding value was very low; a good spring straw was in many cases much more valuable. In his general opinion the meadow hay was only suitable for supplementing the straw yield, and did not provide a tasteful protein rich feed so much required for feeding the draught animals and – above all – the cows and young animals in Hungary where grain fodders in general, and protein rich grain fodders in particular, were fed in relatively low quantities. With the Hungarian system of feeding based on maize stalk, chaff and straw the qualitative deficiencies of the hay yield represented perhaps an even greater problem than the low yield averages(18). One of the greatest faults was the general practice of mowing the meadows too late damaging thereby the quality of hay and promoting the growth of weeds.

As to the quality of pastures in Hungary in the inter-war period, the general situation was no better in this regard either. On the contrary, pastures, pasturing and pasture management practically can only be mentioned as inefficiently controlled. It was especially so at the beginning of the twenties, as the "green field" campaign later on made things somewhat easier.

According to the opinion of *Konkoly* the large pasture area registered in Hungary did more harm than good, for it was maintained as a fodder producing area although it was only used as a supplement.

In spite of the fact that the Ministry of Agriculture constantly urged the farm inspectorates of counties to improve the pastures(19), in the absence of any substantial financial support the results obtained were very modest.

The mentioned ploughing of pastures which usually liquidated the grazing land of better quality; the consolidation of holdings which generally shifted the common pastures to lower productivity areas; the already discussed regulation of waterways as well as a general negligence and the overburdening of common pastures ultimately led to their depletion; the pastures were hardly able to provide any feed and so their livestock supporting capacity was reduced to a minimum.

The pastures were at that time rightly called "walking places", as they were much more suitable for walking than for grazing(20).

The neglected state of Hungarian grazing lands was a characteristic symptom of the depressing economic situation of those days, due mainly to a shortage of capital, when profitability was so low that a proper cultivation of pastures – which demanded investments – was not even thought of.

According to statistical data of 1935 the natural grassland areas decreasing in size and rapidly deteriorating in quality were generally overused, having been grazed by more than 1 million standard animals; that is, 1·4 standard animal fell to each hectare of these poor pastures.

Beyond pressing the execution of the law decrees of 1894 (XII) and 1913 (X), the period discussed began to change the improper pasture conditions and unfortunate situation of grazing by the afore-mentioned "green-field campaign" started in 1929.

This campaign was backed up by the government too. Its first and most important aim was to cultivate and improve the meadows and pastures. The later organized four regional Green Field Associations undertook the tasks of surveying the pastures, giving expert advice, establishing model pastures, preparing pasture plans, organizing competitions, professional courses, distributing grass seeds, clearing away the bush, exploring and realizing the possibilities of irrigation, etc. Its first and immediate results were seen in the common and village pastures, but its beneficial effect was indirectly felt in a much wider scope.

According to reports of the regional farm inspectorate (1935) the preferential grass-seed action, the activity of the Green Field Association as well as the training courses on meadow and pasture management did a great service(21).

The County Farm Inspectorate of Somogy gave account (1938) of a celebration held at Sárvár at the end of an eight-day course of the Green Field Association, when the title "Green-Field Farmer" was conferred on 41 farmers amidst great enthusiasm(22).

When speaking of the relationship between natural grassland area and fodder production we must not forget that their ratio does not characterize the livestock supporting capacity of a given area. *G. Pazár* pointed out that in Europe the ratio of arable area to total area of meadows and pastures had no connection with the number of livestock, which contradicts the view that the large meadow and pasture area is the main precondition for maintaining a great number of animals(23).

In spite of all this, what was characteristic of Hungarian pastures in the inter-war period was that in many regions they were called "walking places". This was a serious disadvantage, because that kind of grazing could only have an influence on the hardiness and unpretentiousness of animals, while their productivity was always hindered by it. The worst consequence of the negligence of pastures was the low degree of utilization of the protein sources of the cheapest and highest biological value. One of the greatest "sins" in the management of pastures was that in early spring, or in summer when the weather was rainy, the animals were driven to the wet soils of pastures where they trampled down the grass and ruined the pasture.

It is worth dealing with the common pastures separately. Some characteristic details of the reports of farm inspectors will be given here. Moson County reported on the neglected state of the grazing area; Nógrád-Hont on the poor condition of the pastures all over the county (1922). In Tolna County (1923) the common pastures were seriously neglected, overgrown by thorn and bush in the whole county. On most common pastures the grass was so poor that it could not be grazed. In Zala (1924) the common pastures of the county were so much neglected that in many places grazing was impossible, and they were only used for walking the animals on. In Veszprém (1925) the grazing lands were more or less neglected all over the County. In Zemplén (1926) almost the total pasture area of the county

was in a deplorable state. Fifty per cent of the existing pasture area did not even produce grass. In Békés County (1928) pasture management was only carried on with extensive methods. In Baranya county owing to the very bad condition of common pastures the inhabitants of many villages changed over from grazing to stalled management. In Nógrád the common pastures were not only in bad condition, but were neglected too(24). In Győr County the yield and profitability of pastures were reduced so much that most of the interested persons thought of ploughing them up and converting them into arables(25). Tolna County reported even in 1937 that in most villages the poorest lands were used as common pastures(26).

The causes of all this are revealed by the following. According to a report of Sopron County (1930) most farmers – while taking great care of their own lands – paid very little attention to the common pastures. Later (1934) it was reported that the natural grassland areas owned in common were completely neglected, neither money nor work were spent on them(27). According to the Farm Inspectorate there was a general tendency to break up the grazing lands. The pastures were hardly cared for or cultivated by the interested parties in spite of an increased control exercised by the authorities – reported Pest County(28) in 1934. The total indifference of public institutions was suggested by a report of Abaúj-Torna County (1933), according to which a preferential loan of 20 years' expiration granted for the amelioration of pastures was not drawn on by any of the interested parties. In the course of a preferential grass-seed action in 1933 no request was made(29). All this can perhaps be best characterized by a summarizing report of a farm superintendent covering 13 counties (1928), according to which the "fate of the pastures" was generally thought "to be in the hands of the Lord; if the spring is favourable, then there will be good pastures, if not, then any effort of amelioration is in vain"(30).

In some counties the pasture area was small. So e.g. in Vas County (1922) 171 villages had no grazing lands(31). Most common pastures (1930) were of small area and used for grazing pigs on(32). In the Csanád County (1927) on account of the low acreage of grazing lands no rational pasture management could be carried on(33). In Tolna County too (1933), common pastures – due to their small extension – were mostly used as runways only(34).

The organization of grazing associations according to instructions of the law decree of 1913 (X) caused difficulties, and they spread slowly in the country. And even the few effectively organized ones did not function efficiently. Borsod County reported e.g. (1931) that the grazing associations established did not come up to expectations, on the contrary, in most places the administration and management of pastures showed a decline(35). According to the Farm Inspectorate of Zemplén County (1926) the main objections to the grazing associations were: it was expensive, the members were ignorant of their rights and the management was not satisfactory(36).

A report of Nógrád County (1933) gave account of the general experience that the grazing associations did not come up to the expectations, partly because even

the more sensible part of the village population was not intelligent enough to understand the spirit of the law, and taking over the command bring about harmony among the interested parties(37).

All this clearly indicates that neither the meadow hay production of the country nor the livestock supporting capacity of the pastures satisfied the fodder demand of the livestock, so the importance of field-grown fodder crops – in accordance with the reduction and deterioration of grassland areas – increased at an even faster rate.

Field growing of fodder crops

There are data available to prove that developments in the field growing of fodder crops involved favourable changes. Statistical data for the post-war territory of Hungary show that parallel with decreases in meadow and pasture areas the acreage of arables increased.

This shift in proportions is characterized by the following data:

	1853		1895		1935	
Meadow (thousand ha)	1 070	(11·5%)	799	(8·7%)	661	(7·1%)
Pasture	1 611	(17·3%)	1 268	(13·8%)	983	(10·6%)
Arable	3 453	(37·3%)	5 107	(55·5%)	5 507	(60·3%)

Thus, in the above period of almost one hundred years the acreage of arables increased by 23·1 per cent.

While before 1918 the arable area only made up 45·5 per cent of the total area of Hungary, on the present area of the country it was 60·9 per cent. Thus, the proportions in these regions shifted in favour of the arable providing thereby ample possibility for the development of fodder growing. However, in the inter-war period, the arable area no longer increased; in 1938 its proportion was almost unchanged – 60·4 per cent. From 1921 to 1938 the arable area only increased by 44·3 thousand hectares. This increase of area was primarily due to the breaking up of pastures.

To make the correlations clear when outlining the general situation let us cast a retrospective glance on *A. Kiss*' data(38).

In his judgement on the present area of Hungary the harvested sowing area showed the following percentage growth compared to the 1870–1873 period.

	Grain fodder	Fodder beet	Papilionaceae	Other roughage
1883–1886	14	100	65	54
1893–1896	15	235	136	144
1911–1915	38	351	282	295
1923–1927	32	291	418	288
1933–1937	38	411	444	258

Table 51. Harvested sowing area (1870–1879 = 100%)

In the column of grain fodders maize, barley and oats, under Papilionaceae perennial Papilionaceae and other roughage the annual ones are included.

The data of Table 51 show an overall progress. The total area of field fodder crops considerably increased. The area of papilionaceous fodder – and this was the most important – showed a particularly outstanding growth. It was only the area of oats which decreased, and that of maize which increased rather "moderately", by some half a million hectares(39).

I. Asztalos' comparison of the field fodder area and natural grassland area on the post-war territory of Hungary is highly instructive:

	1895		1935	
Fodder crops (1000 ha)	1 981	(48·9%)	2 625	(61·5%)
Meadow, pasture (1000 ha)	2 068	(51·1%)	1 644	(38·5%)

On an average of the period between 1931 and 1940 the fodder crop area had the following structure(40).

Fodder crop growing 2 675 thousand ha (62·1%)
Meadow and pasture 1 634 thousand ha (37·9%)

In the same period the different type of fodder crops had the following shares in the field growing area of fodder crops

Grain fodders	43·2 per cent
Papilionaceae	8·4 per cent
Other roughage and succulent fodders	10·5 per cent

When breaking it down to the most important fodder crops we obtain the following data for the average shares(41) between 1931 and 1940:

Maize	20·8	Sainfoin	0·6
Barley	8·3	Other roughage	2·0
Oat	4·1	Fodder mixture	2·4
Alfalfa	3·7	Green maize	1·3
Clover	2·2	Fodder beet	2·4
		Total	47·8

Of the total area of 2 675 thousand hectares 33·2 per cent was occupied by grain fodders and 14·6 per cent by rough and succulent (bulk) fodders.

The most important fodder crops grown in the field were: maize, barley and oat of the grain fodders; alfalfa, clover, sainfoin and crimson clover of the papilionaceous fodder crops; winter and summer vetches of the fodder mixtures; Hungarian grass and millet of the other roughage; beets, potato, green maize and pumpkin of the succulent fodders; and legumes requiring already a separate grouping at that time.

The grain fodders

Examining the position of grain fodder growing production of maize we find that in the period concerned *maize* was, after wheat, the crop grown on the largest area in Hungary.

The harvested area and yield of maize showed the following trends in Table 52 in the middle decade of the period discussed:

Year	Area thousand ha	Yield thousand q	Mean q/ha
1925	1 074	22 345	20·7
1930	1 054	14 071	13·4
1935	1 150	14 183	12·3

Table 52. Production of maize

From 1920 to 1938 the highest average yield was 23·1 q/ha (1937) and the lowest 9·2 q/ha (1921).

This comparison throws some light on how unreliable the fodder reserve —based especially on maize— of livestock farming in Hungary was. It was rightly pointed out in a 1939 report of the National Chamber of Agriculture speaking of the "unhealthy fluctuation" of maize yields that "the fodder requirements of livestock farming in Hungary consume the total maize crop of years with better average yields. So in years with lower yield averages maize shortage occurs . . ."

A more realistic and characteristic picture is obtained by the comparison of sowing areas and yield averages (Table 53) in periods with different emphasis on livestock farming(42).

Period	Area sown to maize thousand ha	Average yield q/ha
1920–1921	936	13·8
1925–1929	1 085	16·6
1930–1934	1 131	16·8
1935–1938	1 174	20·2

Table 53. Average yields and production of maize

According to the above table both the area sown and the average yield grew, that is, a definite progress was made, as proved by the relevant statistical data.

The maize deserves special attention not only because—grown on 20 per cent of the total arable area of the country—it provided an annual grain yield of some 20 million q, but also because almost every part of this plant serves the purpose of feeding. Maize stalk, husks, green maize, silage maize, various fodder mixtures prepared with maize—all of them are utilized as feedstuffs. As *S. Konkoly-Thege* puts it, the Hungarian farmer gives the animals as much maize stalk, straw and husks as they are able to consume, and only adds some beet and hay—if he has them—as a supplement(43).

It is not about the feeding value of maize grain that we want to speak here, —no matter how important the question of concentrates is, it is not the grain

and industrial fodders that have ever given the true character of the feeding system of Hungary, – but the importance of the maize stalk, a fodder type belonging to the group of roughages, that will be analysed in the period concerned.

Free from any prejudice, the maize stalk can be said to have been of the greatest benefit, and at the same time the greatest plague of the livestock in that period too.

It is beyond question that maize stalk provided the basis of winter feeding – especially in the peasant livestock farming. In poor years with drought and flood it was resorted to as a means of survival. The maize stalk with its starch value of 20 per cent and protein content of 1 per cent was only important for its extraordinary volume. The maize stalk was of special importance when considering the fact that Hungarian farmers produced half as much roughage as would have been required(44). We are convinced that the missing other half – or at least a considerable part of it – was made up, besides hay and straw, of the maize stalk.

All this evidently was so because this produce, utilizable for feeding as well, as a natural concomitant of maize growing was willy-nilly present and had somehow to be disposed of – used or destroyed.

This beneficial role just mentioned of the maize stalk had a dangerous effect, namely, that on account of its usefulness in was considered and reckoned with as a fodder of identical value with other fodders, although it ought to have been given a secondary role among the fodder crops, and the acreage of other roughages should not have been restricted. This unfortunate practice, as a result of which farmers did not even plan to grow by field cultivation the amount of rough fodder sufficient for feeding their animals, caused very great damage to Hungarian livestock farming in the inter-war period.

Table 54 shows the percentage share of maize in the arable area, standard animal number and yield averages in the major regions of Hungary(45) in 1935.

In the period discussed a great number of maize varieties were grown in Hungary. Of the most important "domestic" varieties the following ones are worth mentioning: pignoletto, fehér gyöngy, putyi, sárga magyar, fehér hosszúcsövű, páduai, fehér lófogú, sárga lófogú and mazsolamagvú. Maize breeding was mainly carried on at Kompolt, Mindszentpuszta, Lovászpatona, Bánkút, Petterd and Eszterháza. The most famous maize breeders were: *F. Lészay* (Kolozs County 1880), *L. Lázár* (Lepusnyak 1884), *L. Kovács* (Alcsut 1890), *E. Grábner* (Magyaróvár 1909, then Zalaszentgrót), *L. Boros* (Bánkút 1895), *R. Fleishmann* (Ruma 1908, then Kompolt 1918), *F. Günther* (Eszterháza 1920), *E. Papp* (Mindszentpuszta 1920), *F. Somorjai* (Szeged 1930), *K. Udvaros* (Eszterháza 1938), *E. Kurnik* (Iregszemcse 1939), etc.

	Arable area	Standard animal	Yield average
Transdanubia	19·1	45·0	16·0
Great Hungarian Plain	25·4	42·2	10·3
Northern Hungary	13·3	12·8	12·3

Table 54. Percentage share of maize (in q/ha)

In those days the time of ripening was thought to be highly important, and it was generally believed that in Hungary only those maize varieties were worth growing which were sure to ripen before the autumn frost set in, that is, till the end of October at the latest(46).

When speaking of maize growing, we cannot leave unmentioned that hybridization was already correctly judged at that time.

Grábner pointed out that a proper heterosis effect, i.e. the more vigorous development and higher productivity of the first generation originating from interpollination, could be attained when two different maize varieties flowering at the same time were sown side by side in alternating rows, and the seed of one of them, whose tassels had been cut off before flowering, was used next year for sowing. Such seeds as obtained from flowers pollinated by another variety were found to be more productive provided the pollination was performed with a suitable variety. However, the effect was only felt in the first generation, so the process of hybridization had to be repeated every year, and the maize varieties best suited for this purpose under the given conditions chosen empirically(47).

The importance of *barley* was primarily determined by its multipurpose utilization (feeding, brewery, distillation, pearl-barley and *Esatz* coffee production). The barley grist was considered in Hungary to be the most important grain fodder after maize. It played a leading role in the feed of piglets, sires and fattened porkers, further as a supplementary grain fodder during the lactation period. The straw of summer barley was also regarded as a useful roughage. Its husks were not, however, used for feeding for fear of infections by actinomyces.

Year	Area thousand ha	Yield thousand q	Mean q/ha
1925	412	5 537	13·4
1930	458	6 010	13·1
1935	428	5 564	13·0

Table 55. Sowing area and yield of barley

In the period between 1920 and 1938 the highest yield average was 18·1 q/ha (1930), the lowest 9·2 q/ha (1920), that is, the barley showed an "amazingly" high fluctuation of yield.

Of the total production area of barley 23·1 per cent was sown to winter, 76·9 per cent to summer barley (1935). In the same year the yield average of winter barley was 13·9, while that of summer barley 13·0 q/ha.

The sowing area and yield average of summer and winter barley, respectively, are shown in Tables 56 and 57.

Period	Area sown thousand ha	Yield average q/ha
1920–1924	408	9·9
1925–1929	354	13·8
1930–1934	396	13·3
1935–1938	370	13·4

Table 56. Summer barley

Period	Area sown thousand ha	Yield average q/ha
1920–1924	60	10·9
1925–1929	77	14·5
1930–1934	82	14·3
1935–1938	90	15·0

Table 57. Winter barley

Thus the growing of winter barley showed a much more favourable development that that of summer barley. The difference was obviously caused by the higher yield average of winter barley(48).

The percentage proportion of the barley area to the total arable area as well as the yield averages of barley in the main regions of Hungary in 1935 are given below:

Transdanubia	8·8 %	14·4 q/ha
Great Hungarian Plain	6·5 %	12·0 q/ha
Northern Hungary	11·6 %	12·2 q/ha
National average	7·9 %	13·0 q/ha

In the period discussed barley was in the first place a summer cereal for more intensive conditions grown mainly as malting barley (brewery) and fodder barley. Winter barley grown originally on a small area was produced exclusively for feeding purposes.

Special attention is to be paid to the fact that in the period just discussed the sowing area of winter barley was redoubled indicating an increased interest in feeding.

The contemporary summer barley varieties were all suitable for feeding purposes as well. Of them the Moravian Hanna (developed by *Proskovetz*), of the Hungarian varieties those developed by *Bauer*, *Mesterházy* and *Skublits*, as well as the "hatvani", "taktaharkányi", "peresztegi" and earlier the "diószegi" are worth being mentioned.

The *oat* was a crop sown in spring and providing grain fodder in regions with less favourable weather conditions and poorer soils. In these regions it was generally sown to replace barley. In the inter-war period its importance gradually decreased parallel with the reduction in the number of horses. Its sowing area decreased accordingly by 94·4 thousand hectares during the mentioned years (Table 58).

From 1920 to 1938 the highest yield average was 15·5 q/ha (1933), the lowest 8·0 q/ha (1931). Fluctuation, here too, was rather high (Table 59).

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	290	3706	12·9
1930	73	2612	10·6
1935	203	2459	12·1

Table 58. Area and yield of oats(49)

Period	Area sown thousand ha	Yield average q/ha
1920–1924	327	9·9
1925–1929	281	13·4
1930–1934	239	11·9
1935–1938	221	12·4

Table 59. Sowing area and yield average of oats in the different periods

Percentage proportion of oat area to total arable area as well as the average oat yields in the main growing regions of Hungary in 1935:

Transdanubia	5·4 %	13·2 q/ha
Great Hungarian Plain	2·5 %	10·8 q/ha
Northern Hungary	3·8 %	11·1 q/ha
National average	3·7 %	12·2 q/ha

In the period in question oat was mainly a summer cereal for extensive production conditions and grown almost exclusively for feeding purposes.

Of the contemporary foreign varieties the Doppau and abundance introduced by *S. Cserháti*, and perhaps Lotzhow's oat variety are worth mentioning. Varieties developed from the old Hungarian bannered oat were: Székács, Fleischmann, Eszterháza, Lovászpatona and Hatvan.

In spite of its minor importance we have to mention the fact that Hungarian plant breeders dealt with a winter type of oat as well *(O. Legány, K. Kolbai)*.

Papilionaceae

Among the papilionaceous fodder crops lucerne played an increasing role occupying about one-third of the total area of roughage crops. Although it was rather evenly distributed in the country, its importance – due to its drought-resistance – was the highest in the Great Hungarian Plain.

In the period between 1923 and 1938 the highest yield average was 47·8 q/ha (1938), the lowest 28·3 q/ha (1923). Fluctuation here was more moderate than in the former cases. (As in Table 61.)

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	183	7 296	40·0
1930	163	4 951	30·0
1935	188	5 915	31·5

Table 60. Sowing area and yield of lucerne

Period	Area thousand ha	Yield average q/ha
1923–1924	200	33·1
1925–1929	167	36·0
1930–1934	180	32·3
1935–1938	214	44·5

Table 61. Sowing area and yield average of lucerne

The growing of lucerne on a widespread scale was due to its excellent properties. Namely, lucerne growing meant abundant feed supply, optimum protein level, increased soil fertility (nutrients, humus), minimum draught and manpower requirements, and above all cheap, multipurpose and easy to store feed for the farms. Lucerne not only required but also created intensive conditions. In the inter-war period, when farming became more intensive, lucerne readily fitted in with the changed situation, all the more so because its growing was not curtailed in any way. It became more utilizable with the introduction of the hammer mill of which the first Hungarian type was rightly named after the lucerne *(Medicago sativa)* "Medikágó". With this the lucerne known so far as a mere roughage became grouped with the grain fodders, and its use was no longer restricted to the feeding of ruminants. "Let us give our pigs home-produced lucerne meal" wrote at that time *B. Kenessey*(51). In addition, lucerne fields could be used in certain cases as pastures too.

In the period discussed lucerne was a rather widely grown roughage crop in spite of the fact that it thrives only in sufficiently calcareous deep soils with good quality subsoil and is primarily a plant for heavier soils.

Mainly the common, or blue flowered lucerne, to a lesser extent the "homoki" with multicoloured flowers, "sárkerep" (Swedish) and black medic varieties were grown.

The Hungarian blue-flowered lucerne had two types developed in Hungary: the "kompolti" and the "eszterházai". Of the latter the thick-foliaged, procumbent *E 3000* strain, which later became a victim of war, was quite excellent. The multicoloured "homoki" lucerne of lighter, sandy soils was improved and propagated at Magyaróvár, Kompolt and Gödöllő. The "hardy" sárkerep lucerne and the yellow-flowered black medic were less important and did not attract the attention of breeders at that time.

After lucerne the clover (red clover) was the most important papilionaceous fodder crop. It covered some one-fifth of the total area of roughage crops and had a considerable role in regions with more precipitation.

In the period between 1923 and 1938 the highest yield average was 38·8 q/ha (1937), and the lowest 25·0 q/ha (1923). There was a rather moderate fluctuation.

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	128	4 324	33·7
1930	144	3 965	27·5
1935	102	2 740	26·9

Table 62. Sowing area and yield of clover

Period	Area thousand ha	Yield average q/ha
1923–1924	122	28·3
1925–1929	133	31·4
1930–1934	135	28·2
1935–1938	113	35·2

Table 63.

The sowing areas and yield averages of clover in the characteristic periods are shown in Table 63.

The less drought-enduring clover was mainly sown in Transdanubia and the northern parts of Hungary, and only 10–15 per cent of it fell to the dry Great Hungarian Plain with low humidity. In those days the red clover, which was less sensitive to the quality of the subsoil, was generally believed to be a plant best fitted for calcareous heavier soils.

The common Hungarian red clover called "operative" red clover and used for field production, and of the foreign types the Styrian clover were the only clover types grown fairly efficiently in Hungary. To our best knowledge no clover breeding was carried on in the period discussed, although at Magyaróvár 62 "red clover derivatives" were tested.

We have to mention here the white clover and alsike clover too, although it was very seldom that they were sown by themselves for fodder growing. However, they played an important role in various grass mixtures.

Of the papilionaceous fodder crops *sainfoin* covered the largest area after the clover mainly in regions with poorer soils and unfavourable weather conditions.

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	37	1 064	28·8
1930	35	844	24·1
1935	34	797	23·5

Table 64. Area and yield of sainfoin

Period	Area thousand ha	Average yield q/ha
1923–1924	34	23·4
1925–1929	34	18·5
1930–1934	33	28·5
1935–1938	34	27·9

Table 65.

From 1923 to 1938 the highest yield average was 32·3 q/ha (1926), and the lowest 21·0 q/ha (1932). Fluctuation was even less than in the former case.

The sowing area and yield average of sainfoin in the characteristic periods are given in Tables 64 and 65.

The wide-spread cultivation of sanfoin was mainly due to the fact that although a perennial legume it gave sufficient yields in soils where lucerne and clover could not be efficiently grown. In addition, owing to its deeply penetrating roots it endured even a long-lasting drought well, so with the exception of peaty and acid soils it could be grown almost everywhere.

In the period discussed it was known in three variations: the especially unpretentious, so-called common sainfoin, and the twice and three times cut – called also giant – sainfoins. The breeding of twice cut sainfoin was carried on at Kompolt (Persian sainfoin), while that of the three times cut sainfoin at Nagybát *(L. Császár)*.

Finally, the unpretentioes annual *crimson clover* deserves to be mentioned as it could be produced on areas where other papilionaceous fodder crops would not grow.

From 1923 to 1938 the highest yield average of crimson clover was 31·3 q/ha (1926), and the lowest 21·2 q/ha (1934). It was this plant of all papilionaceous fodder crops that showed the lowest fluctuation of yield (Tables 66 and 67).

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	19	61	32·1
1930	22	51	23·2
1935	34	85	25·0

Table 66. Sowing area and yield of crimson clover

Period	Area thousand ha	Yield average q/ha
1923–1924	20	24·3
1925–1929	22	27·5
1930–1934	26	27·3
1935–1938	36	26·7

Table 67. Sowing area and yield average of crimson clover

The crimson clover – while mostly grown on medium heavy calcareous loam – was rather widely produced on clay and sand too. In the inter-war period it was generally known in three variations: the most frequently grown, best-proved crimson, the early but not sufficiently frost-resistant flesh-coloured, and the less vigorous white clover.

To sum up what has been said about the papilionaceous fodder crops: they played a highly important role both from the point of view of soil fertility and from that of protein supply. It deserves attention that Papilionaceae were the fodder crops of smaller farms in the first place, as more than 60 per cent of their sowing area was owned by small farms.

On the average of the years 1931–1940 some 360–370 thousand hectares were sown to papilionaceous fodder crops on the present area of Hungary. Their percentage distribution among the main regions of the country can be found in Table 68.

Crops	Transdanubia	Great Hungarian Plain	Northern Hungary
Lucerne	35·2	50·6	14·2
Clover	61·7	19·0	19·3
Sainfoin	76·4	20·2	3·4

Table 68.

Fodder mixtures

The fodder mixtures grown at that time can be divided into two large groups: the annual roughage mixtures, and the perennial clover grass mixtures.

The annual roughage mixtures were sown partly in autumn, partly in spring. Their greatest advantages were: they provided a relatively large volume of fodder, had a more favourable ratio of protein; frost-sensitive plants thinned after a too severe winter were replaced by frost-resistant ones, and last but not least they offered a possibility of double cropping.

Of the fodder plants *sown in autumn* mixtures with winter vetch and the ones with pea were of the highest importance. The supporting plants of the mentioned legumes were: winter wheat, winter barley and winter rye. Of the vetches the winter, the hairy and the Hungarian vetch were used in the mixtures, sometimes even in combination.

The mixture of winter pea and winter wheat was especially popular, mainly in intensive dairy farms.

The mentioned fodder mixtures of those days contained 64 per cent winter wheat and 36 per cent winter pea, or 63 per cent hairy vetch and 37 per cent rye; or 69 per cent Hungarian vetch and 31 per cent wheat.

In the crop rotation autumn fodder mixtures generally followed a cereal, or were grown as second crops or between two grain crops.

The characteristic types of autumn fodder mixtures were at that time the Keszthely mixture, the mixture of rye and crimson clover and Legány's mixture. The German Landsberg mixture could not be widely introduced into Hungary.

The Keszthely mixture (*K. Berger*) consisted of winter coleseed and rye generally sown during August mainly in weekly periods (80–90 kg rye + 15–20 kg coleseed/ha).

The importance of the mixture of rye and crimson clover (*K. Kerpely*)—as referred to in the discussion on crimson clover—was due to the fact that it gave substantially higher yields than crimson clover sown by itself, and provided a much better quality fodder than winter fodder rye when sown by itself. In this fodder mixture 80–90 kg rye and 30–40 kg crimson clover were used per hectare.

Legány's fodder mixture consisted of hairy vetch, crimson clover and wheat (*Ö. Legány*). According to the contemporary practice some 70 kg hairy vetch, 20 kg crimson clover and 80–100 kg wheat were used for each hectare. A variation of this mixture mostly suitable for heavier soils was a mixture of 50 kg hairy vetch, 15 kg crimson clover and 70 kg rye per hectare usually grown in sandy soils.

In the spring-sown group of annual roughage mixtures the one of oats and vetches was undoubtedly the most important at that time. According to the contemporary opinion "it was an expensive fodder cut only once a year and giving a medium hay yield"(53).

That it was still widely grown was due to the fact that it was sown in spring and was an excellent forecrop to winter wheat. In the rotation system the mixture of oats and vetches was usually grown between two cereals. Its seed generally consisted of 25 per cent oats and 75 per cent vetches.

Besides the mixture of oats and vetches the one of peas and green maize deserves attention. Its growing was limited by the fact that the pea played some role only beside maizes of relatively poor development, and that peas, as a crop requiring

a very early sowing had to be sown separately from the maize, a crop of late sowing-time. Though it seems illogical, it was a general practice in the inter-war period to sow maize first and oversow it later with peas.

Beyond the mentioned ones a fairly large number of other annual fodder mixtures sown in spring were also grown – though to a lesser extent – at that time. So mixtures of summer peas and oats; of summer peas, vetches, oats and occasionally barley, sometimes with horse-bean; mixtures of vetches and white mustard with oats or barley; mixtures of maize and millet; mixtures of buckwheat and maize or white mustard, occasionally with spurrey, sometimes millet, less often with sand-pea and oat; mixtures of winter coleseed and white mustard; and of spurrey and winter coleseed were sown as well. In the contemporary statistics fodder mixtures are listed partly as winter, partly as summer "vetch mixtures". According to the relevant data the area and yield of the former can be found in Table 69.

From 1923 to 1938 the highest yield average was 38·5 q/ha (1927), the lowest 24·9 q/ha (1931).

The area and yield of vetch mixtures sown in autumn in the characteristic periods are given in Table 70. Vetch mixtures sown in spring see Table 71.

From 1923 to 1938 the highest yield average was 32·3 (1926), the lowest 20·5 q/ha (1931).

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	22	69	31·4
1930	23	64	27·8
1935	25	65	25·0

Table 69.

Period	Area thousand ha	Yield average q/ha
1923–1924	27	29·1
1925–1929	21	30·4
1930–1934	25	27·3
1935–1938	25	30·7

Table 70.

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	190	5 909	31·1
1930	140	3 431	24·5
1935	122	2 651	21·7

Table 71.

Period	Area thousand ha	Yield average q/ha
1923–1924	82	25·6
1925–1929	181	29·6
1930–1934	140	23·8
1935–1938	128	26·2

Table 72.

The area and yield of vetch mixtures sown in spring in the characteristic periods are shown in Table 72.

The area of mixtures sown in autumn was only 15–20 per cent of those sown in spring. This "disproportion" was not caused by the absence of a correct view but by a situation in which the accumulation of autumn operations prevented the sowing of a sufficient amount of autumn sown mixture.

In the group of fodder mixtures the *perennial clover-grass mixtures*, which at that time were placed in the groups of grass mixture, clover-grass mixture as well as of mixtures for establishing meadows and pastures with, gained increasing importance in the inter-war period.

According to the contemporary definition the grass mixture was a mixture usually sown to replace a pure stand of clover, in which the proportion of clover was 80 and that of grass 20 per cent. In the most frequent composition the clover was red clover and the grass mostly Italian grass, or occasionally onion couch or timothy. This ley was only used for mowing or grazing for a few years.

The clover-grass mixture – called then "alternate grasslands and pasture" – was different from other mixtures inasmuch as it was intended for a longer period and consisted accordingly of a wider range of plants, excluding the rapidly disappearing clovers. The most common papilionaceous plants in this mixture were: red, white and alsike clover, and sainfoin, while of the grasses rye-grass, onion couch, blue grass, furthermore meadow fescue, oat grass, dactylis, timothy, meadow foxtail, etc.

In mixtures used for the establishment of permanent hay-fields, i.e. meadows, the proportion of clovers substantially decreased in favour of grasses. Contemporary books in this field offered a full choice of prescriptions for a great diversity of soils.

When establishing pastures with clover and grass, the plants composing the mixtures, and their proportions were determined – apart from the soil conditions – by the animal species they were planted for. In these mixtures, however, the proportion of clovers was maximum 15–20 per cent.

Other rough fodders

Of the rough fodders grown in the field in the inter-war period – besides those mentioned so far – only the Hungarian grass and the millet deserve some attention.

Of these two plants the *Hungarian grass* was more important with respect to feeding, if only because its sowing area was generally much larger than that of millet. In addition, the Hungarian grass was grown as a rough fodder, while the millet primarily for its grain yield (Tables 73 and 74).

During the years between 1923 and 1938 the highest average yield was 32·2 q/ha (1926) and the lowest 22·2 q/ha (1935).

The highly drought-resistant and thermophilous Hungarian grass was mainly grown for its suitability either as a second crop, or for the replacement of destroyed

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	25	783	30·4
1930	23	526	22·8
1935	28	617	22·4

Table 73. Area and yield of Hungarian grass

Period	Area thousand ha	Average yield q/ha
1923–1924	27	24·8
1925–1929	28	27·8
1930–1934	26	24·9
1935–1938	25	28·4

Table 74. Area and yield average of Hungarian grass in the characteristic periods

stands. In spite of its pilose stiff stalk and foliage its hay was willingly consumed by the animals, and it was therefore sown to supply rough fodder. As a subsidiary crop it was not included in the rotation system.

Of its variations – although the Californian and Italian millet were known as well – the common Hungarian grass was generally grown. Its breeding was carried on by *E. Székács* at Árpádhalma (1915), and *R. Fleischmann* at Kompolt (1918).

As mentioned before, the importance of *millet* was lower than that of the Hungarian grass because the former was seldom grown to provide rough fodder, and was accordingly included in the statistics as a grain crop. The reason why we deal with it in the group of roughages is that at that time its straw was considered a "good" fodder provided it was not mouldy or blighted (Tables 75 and 76).

From 1923 to 1938 the highest average yield of millet was 10·4 q/ha (1925), and the lowest 6·4 q/ha (1931).

When speaking now of millet as a rough fodder, apart from its straw, we mention it because of its role in fodder mixtures, and because in those days it was rather widely grown as a second crop, though its acreage and yield cannot be determined from the statistics. As a main crop it was very seldom included in the rotation system.

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	12	125	10·4
1930	8	62	7·8
1935	9	65	7·2

Table 75. Area and yield of millet

Period	Area thousand ha	Yield average (grain) q/ha
1923–1924	20	7·7
1925–1929	13	9·3
1930–1934	9	8·6
1935–1938	8	9·4

Table 76. Area and yield average of millet in the characteristic periods

Of its variations the "panicled pap-millet" was grown at that time. Its improved varieties were: red and white Lovászpatona, and Lovászpatonai giant millet.

Succulent fodders

Of the succulent fodders beets were of the greatest importance. Of them the *fodder beet* was the one occupying the largest area.

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	103	25 848	251
1930	110	22 020	200
1935	127	22 014	173

Table 77. Area and yield of fodder beet

Period	Area sown thousand ha	Average yield q/ha
1923–1924	113	171
1925–1929	104	232
1930–1934	126	206
1935–1938	138	229

Table 78. Sowing area and yield average of fodder beet in the characteristic periods

In the period between 1923 and 1938 the highest yield was 251 q/ha (1925) while the lowest 134 q/ha (1921).

The importance of fodder growing was mostly determined by the demand of cattle farming. The fact – proved today at a scientific level – that in milk production fodder beet can only be substituted by sugar beet was known from experience by the owners of large estates and small farms in the inter-war period. For this very reason in such farms not producing sugar beet, fodder beet was considered to be the most important winter fodder, but it was widely grown by sugar beet producers since beet cuttings were never equivalent to fodder beet in milk production.

Of the fodder beet types the spherical (Obendorfer, etc.) cylindrical (Eckendorfer, etc.) olive shaped (substancia, etc.) and the tap rooted (mamoth, etc.) ones as well as the fodder sugar beets (eszterházai, etc.) are worth mentioning from the period in question. Extensive breeding work was carried on with fodder beet in those days. In the inter-war period the improved fodder beet varieties of Bábolna, Monor, Eszterháza and Mauthner were given state certification.

Sugar beet undoubtedly deserves being qualified as a fodder crop partly because in the period discussed it supplied – even if not in the first place – fodder (head, cuttings, molasses), partly because some of the sugar originally produced for human consumption was also used for feeding purposes (denatured feeding sugar). In addition, when the factories limited the production of sugar, farms very often sowed sugar beet directly for feeding purposes, or fed up the amount not taken over. According to *B. Szemző* the feeding value of industrially processed sugar beet – taking only the head and the by-products returned by the factory into

consideration and excluding the produced sugar – was equal to that of the hay yield of red clover grown on the same area.

Sugar beet – besides producing the highest number of calories per unit area – was of special importance as its efficient cultivation required high level soil conservation and cultivation, plant tending, and – above all – professional knowledge, promoting thereby the intensification of farming everywhere. Sugar beet production not only required intensive conditions but through its elacting character created them as well, mainly by providing by-products suitable for feeding purposes and becoming the basic feedstuffs of intensive livestock farming (dairy farming, cattle fattening).

In spite of the fact that in the inter-war period sugar beet growing was restricted to a great extent (beet contingent), its most characteristic data are still worth being presented.

From 1923 to 1938 the highest average yield was 231 q/ha, and the lowest 164 q/ha (Tables 79 and 80)(55).

Seed distributed by the sugar factories in the inter-war period had to be sown in Hungary, so the main role was played by foreign sugar beet varieties (Kleinwanzleben, etc.). Hungarian bred varieties were then the "Beta", the "Margis" and Patzenhofer's "T" sugar beet.

In those days it was *K. Sedelmayr* who began to deal with the breeding of sugar beet at Sopronhorpács (1930).

The other beets – turnip, wild carrot and parsnip – played a subsidiary role.

The importance of *potato* was determined partly by the essential role it played in human nutrition, feeding, distillation and starch production, partly by its advantage of giving a rather satisfactory yield on poorer, lighter soils and under less favourable weather conditions, too, and finally by the fact that it provided work opportunity in abundance. From the point of view of feeding we have to take into consideration that a considerable part of potato grown for nutrition and industrial purposes was also used for feeding (small and injured tubers, refuse, peel, malt returns, etc.).

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	66	15 274	231
1930	74	14 610	197
1935	47	7 610	164

Table 79. Area and yield of sugar beet

Period	Area sown thousand ha	Average yield q/ha
1920–1924	47	172
1925–1929	68	221
1930–1934	52	200
1935–1938	47	207

Table 80. Sowing area and yield of sugar beet in the characteristic periods

The sowing area and yield of potato showed the folowing trends:

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	261	23 095	88
1930	272	18 414	67
1935	281	13 927	50

Table 81. Sowing area and yield of potato

Period	Area sown thousand ha	Average yield q/ha
1920–1924	258	58
1925–1929	266	74
1930–1934	290	61
1935–1938	293	73

Table 82. Sowing area and average yield of potato in the characteristic periods

In the period between 1920 and 1938 the highest average yield was 88 q/ha (1925) and the lowest 46 q/ha (1921) (Tables 81, 82)(56).

Of the great number of potato varieties those of Wohltmann and Krüger decidedly qualified as "feed potato", and produced in the largest volumes were the most important ones. Potato breeding was started in Hungary by *J. Agnelli*, parish priest at Csár (Nyitra County) as early as 1876 ("Magyar Kincs", "Pannonia", "Hungária") and continued in 1898 by *E. Zierer* at Mikosd (Zala County) with the improvement of varieties for distilling purposes efficiently carried on by a relatively large number of breeders, (J. *Eszenyi, R. Fleischmann, M. Horn, E. Grábner, Ö. Legány, V. Teichmann*, etc.) in the period concerned.

The group just discussed includes the thickly sown *green maize* too. In spite of the fact that this fodder crop was mentioned by the contemporary statistics with a rather modest area, it was of considerable importance in wide practice in the inter-war period, since, it was a general practice to sow green maize in place of any destroyed plant stand, or in plots left unsown; a relatively large volume of green maize was grown as second crop. However, these areas were listed in the statistics generally in the column crops first sown, or in the case of double cropping in that of the main crop (Tables 83 and 84).

In the period between 1920 and 1938 the highest average yield was 306 q/ha (1926), and the lowest 169 q/ha (1923).

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	78	2 068	265
1930	71	1 471	207
1935	66	1 585	240

Table 83. Area and yield of green maize

Period	Area thousand ha	Yield ave.age cca q/ha
1923–1924	74	212
1925–1929	74	251
1930–1934	80	214
1935–1938	74	260

Table 84. Sowing area and yield averages of green maize in the characteristic periods

The importance of green maize was due to the very simple way of its cultivation. It could be sown at any time, had no special soil requirements, was rather resistant to drought, could be sown by hand. It required no special soil cultivation or tending. Seeds were easily available almost everywhere, and at a very low price at that. It gave a great mass of green fodder, was willingly consumed by the animals, and was particularly suitable for ensilage.

A similar type of fodder was the thickly sown sunflower used to replace green maize on poorer soils. It was grown at that time mainly on sandy and gravelled soils, and preserved for winter feeding by hot fermentation in the field. According to *M. Bittera* (1930) "Its advantage over green maize is that it suffers less from drought and is more unpretentious than green maize"(57).

In the group of succulent fodders – of the vegetables grown in the field – it is the fodder gourd that deserves attention beside the colocynth and Jerusalem artichoke.

The *fodder gourd* – apart from seed production – did not play any considerable role in the farming practice of large estates (large, grey winter types). It was, however, generally grown by the peasants on the maize fields, in spite of the contemporary view that this plant was "totally valueless, good only to threaten maize yields"(58).

In the gourd column of the 1935 statistical survey 8·1 thousand hectares of harvested area are recorded with a yield of 1 315 q, i.e. 162·1 q/ha average yield.

Legumes

For the period discussed legumes have to be placed in a separate group, since otherwise they should be ranked partly with the grain fodders, partly with the papilionaceous fodders, partly with the rough fodders and partly with the fodder mixtures.

Of the leguminous fodders peas and vetches were of the greatest importance. Beside them horse bean, soybean and lupin hardly deserve attention.

The *pea (Pisum arvense, Pisum sativum)* was at that time produced mainly for human consumption. Many farmers grew it for export purposes. From a feeding point of view it was primarily important as a grain fodder. The refuse pea (defective, broken and weevilled seeds), the by-products of milling and husking (pea bran, pea pod) were particularly cheap, and accordingly much sought-after sources of protein (meat-type pigs). It must be noted here that in those days the adequate qulity husks and straw of peas were also quite readily used for feeding (Tables 85 and 86).

From 1920 to 1938 the highest average yield was 14·3 q/ha (1933), and the lowest 7·0 q/ha (1924).

With a view to obtaining rough fodder the above mentioned *Pisum arvense*, and the more sensitive *Pisum sativum* were grown. Of the generally used variations of *Pisum arvense* the sand pea sown in spring into sandy soil, and a winter pea sown in autumn are worth being mentioned separately. The former

Year	Area thousand ha	Yield thousand q	Average q/ha
1925	8	88	10·6
1930	12	146	12·3
1935	22	209	9·6

Table 85. Area and yield of pea

Period	Area thousand ha	Yield average q/ha
1921–1924	7	8·5
1925–1929	10	10·5
1930–1934	15	11·5
1935–1938	28	12·0

Table 86. Sowing area and yield average of pea in the characteristic periods

(Pisum sativum ssp. *arvense)* was in the first place the plant of lighter soils. A per hectare amount of about 150 kg pea was sown in early spring mixed with 40 kg barley or oat at the usual spacing of cereals to a depth of 4–5 cm. The winter pea *(Pisum arvense hibernum)* stood the test first of all as an early green fodder, owing to its good flavour and highly favourable effect on milk production.

In that period many were already engaged in the work of breeding peas (*Ö. Legány* 1921, *A. Radnai* 1923, *K. Krausz–S. A. Manninger–K. Tőőler* 1927, *K. Hernfeld–Gy. Eredics* 1929, *O. Knapp–K. Meizner* 1930, *T. Frank* 1932, *E. Papp* 1934, *V. Kopeczky* 1938, *B. Fridrich* 1939, *E. Karnik–A. Oberritter* 1939, *A. Ács–L. Szabó* 1939).

Vetch was the most important plant of fodder mixtures (summer vetch, hairy vetch, Hungarian vetch).

The most widely grown summer vetch *(Vicia sativa)* was a fodder crop sown at that time with oats all over the country. The hairy vetch *(Vicia villosa)*, on the other hand, as a vetch variety for lighter soils sown in autumn, played an important role in the autumn fodder mixtures. The Hungarian vetch *(Vicia pannonica)* belonging to the group of fodder crops sown in autumn was also used in fodder mixtures mainly on better quality soils.

The horse bean *(Vicia faba)* belongs, in fact, to the vetches, but – while willingly consumed as a grain fodder – was not grown as a roughage crop, and so – unlike the other legumes – was not included in fodder mixtures.

The *chick-pea (Cicer arietinum)*, according to *Gyárfás* "not a pea at all", though one of our oldest crops was never widely grown, only sown in gardens as a vegetable or coffee substitute. According to the evidence of a number of seed finds it was known in Hungary as early as in the Bronze Age. High resistance to drought was considered to be its first merit.

Lupin growing spread as a result of the work of *S. Cserháti* and *V. Westsik*. It was grown primarily as a green manure. It was an important step forward when sweet lupin was first sown (1936). On sandy areas its importance both as a dry and a green fodder rose. In the Nyírség (region in the north-eastern part of Hungary) there were villages (Nyírlugos, Nyírkárász) where more than one-third of the arable area was sown to sweet lupin. At the end of the Second World

War (1944) the "contracted seed reproduction area" of the yellow flower sweet lupin was more than 80 thousand hectares. *Grábner* mainly describes the yellow, blue, white and "alkaloid-poor" types grown in the inter-war period. *V. Teichmann* was the first in Hungary to be engaged in breeding lupin (1943).

Among leguminous fodder crops *soybean* must not be left unmentioned, since – though rather insignificant in the inter-war period – it later became quite significant.

It had many variants, of yellow, green, brown and black colour. In Hungary only the early, yellow-seeded soybean was grown. During the decades in question improved varieties were: the universal of Iregszemcse, the small-seeded yellow, the large-seeded white and the Keszthely and Monor soybeans. Apart from Iregszemcse, soybean breeding was carried on at Keszthely, Monor, Mezőhegyes, Magyaróvár, as well as in farms of several sugar factories (Nagycenk, Petőháza).

In the period discussed soybean was cultivated with the same method as dwarf bean, mostly grown in humid regions almost exclusively for its seed which was used for feeding purposes generally in a roasted state as a grain fodder. At that time it was not utilized as a green fodder; its straw was fed, at the most, to sheep. In the inter-war period small farmers did not produce soybean in Hungary

Feeding

Contrary to the general opinion, in the inter-war period the level of feeding in Hungary was far below the West-European level.

True, the effects of general poverty (lack of capital, economic crisis) were felt with respect to feeding as well, and accordingly in farms – large estates or small holdings – compelled to carry on an extensive management due to unfavourable conditions the level of feeding was not satisfactory. For this very reason we must not think that on the estates (large farms) the system of feeding was more adequate and more up-to-date than in the peasant holdings (small farms). The farms, both large and small, well provided with capital generally displayed an up-to-date level of feeding, while those lacking capital were backward. The owners of intensive large estates and the wealthy small farmers – even if not with the same rationality and skill – did the work of feeding rather well, while on extensively managed estates and in the holdings of poor peasants the system of feeding was generally bad.

In spite of the apparent higher technical level of the large farms having qualified farm managers to carry out the feeding, in practice, manorial farms deficient in funds were not able to pay the qualified and competent professional staff adequately and were, therefore, in an unfavourable position. The cream of the profession thus found employment in farms well provided with capital, or in livestock breeding associations, and only the so-called practical professionals of lower education (bailiff, land-steward) were left to the other, extensive farms.

The small farmers – at least the wealthier ones who could afford to do so –

had their animals registered in herd-books paving thereby the way to the experts of livestock breeding associations. On their advice they fed their animals at the same level as the intensive large estates. The poor peasant, however, could not carry on efficient farming, just as the estates lacking capital.

Thus, from the point of view of feed management and feed utilization livestock farming can be divided into two large groups irrespective of farm size: one of them includes the extensive farms with small capital and a low level of feeding, the other the intensive farms well provided with capital where the level of feeding is satisfactory.

A separate group comprised the industrial branch of livestock farming such as milking dairies, industrial fattening plants, cattle fattening enterprises of distilleries and sugar factories, poultry farms, fish farms, etc. Feeding practice here was generally acceptable, since in those days about three-quarters of the production cost were made up by the cost of feeding, so if this balance was upset the whole enterprise went bankrupt.

In the following sections the feeding of the five major domestic animals – cattle, sheep, pig, horse and poultry – will be discussed separately.

Cattle

It should be noted here that in the so-called "cattle districts" the grazing area was generally small (Tolna and Baranya Counties). This was the case with the "famous" western parts of Hungary too (Sopron and Vas Counties). However, where pastures were in abundance, the number of cattle was low. This is only a partial survey of the situation, but it is quite certain that cattle rearing in Hungary was by no means built on pastures at that time. This was not, otherwise, a peculiar phenomenon. Statistics of European countries from that period (1935) show no correlation between number of cattle and size of meadows and pastures anywhere(59).

In the feeding pattern of large estates an increasing rate of fodder grains fed to the cattle was a striking feature, although the same could be seen in Transdanubian peasant farms well provided with capital. This was caused partly by the difficult marketing conditions and low prices of fodder grains, partly by the realization of the advantages of individual feeding.

At the beginning of the twenties the individual method of rearing cows frequently appeared in such papers as published by *Halász* in 1921 and by *Stern*(60) in 1933. *O. Wellmann* clearly pointed out in 1929 that "S. Mándy's farm is an example of how much the milk production of cows can be increased, and the profitability of dairy farming improved through a relative cost reduction of milk production by a rational individual feeding system(61)." Results attained with this system could be seen in the thirties on the dairy farms of Felsőszászberek, Gyálpuszta, Felsőleperd, Földvárpuszta, etc. Since the easiest way of individual feeding is to feed fodder grains, the consumption of the latter increased to an undesirable extent in many places.

To characterize the rate of fodder grain feeding we give here the percentage composition of concentrate consumed in 1925/26 in the controlled dairy farms of Sopron County(62)

bran	38·56
oil cake	11·66
soya flour	4·45
feed meal	16·24
horse bean meal	3·96
cob meal	22·21
pearl-barley	0·55
vetch grits	1·02
millet grits	1·35

Individual feeding may have a highly favourable influence on milk yield and production cost trends, but from the point of view of breeding this method has not provided and does not provide a reliable basis for evaluating the feed conversion of individual animals, since the quantity of feed consumed, and mainly its nutrient content are practically impossible to be determined. On many occasions considerable differences were found between the feeding tables and the actual nutritive value of the feed consumed. In the Földvárpuszta farm e.g. each kind of fodder – roughage and root crops – was chemically analysed in the thirties, and feeding prescribed mainly by taking the results into consideration.

With cows (not controlled) owned mainly by peasants data on individual feeding could hardly throw any light on the feed conversion ability of animals.

Beside the disadvantages of a too high rate of concentrate consumption a wider utilization of legume hay crops should be accounted for. However, compared to the total amount of rough fodders consumed this was rather low, and was far below the level desired, in spite of the fact that their importance was recognized everywhere, and there were hardly any dairy farms without leguminous fodders fed to the animals.

Fodder beet consumption showed favourable quantitative trends, as proved also by an increase in sowing area. At that time all this was seen from a different angle. In the surveyed dairy farms "fodder beet became dominant over cuttings in feeding", – the farm inspectorate of Sopron County pointed out in 1936.

There was a double tendency in the feeding system of cattle in that period: maintenance of the primitive old practices, and application of the most up-to-date methods based on a thorough scientific knowledge.

The former was characteristic of the extensive management conditions of cattle herds, draught oxen, and in many places young animals, while the latter was a typical feature of the intensive system of dairy farms and cattle fattening plants.

In those days animals reared in herds and put to pasture, as well as draught oxen and young cattle were fed according to their condition. If the animals were in good physical condition, hardly any care was taken of their feed, only when

their condition deteriorated, that is, when their "natural" feeding required supplementation. In the case of cattle put to pasture this supplement consisted mainly of green fodders, while the draught oxen were mostly fed on concentrate. At the time of the hard autumn and spring work the latter were given some cob meal, lest the rapid deterioration of their condition caused disability to work.

The grey Hungarian cattle was not usually given such feed supplement, and when the pastures became scorched – sometimes already in summer – these animals lost the excess weight put on in spring, and were sometimes stabled for winter in a lean state. In spring – since their feeding was restricted mainly to acid hay and spring straw – these emaciated animals could only stagger about and collapsed.

In the dairy farms and cattle fattening plants it was quite different. In these places the feed requirement of animals was determined on the basis of starch equivalent and digestible protein content. Moreover, in large estates of intensive management and livestock farms of wealthy small holders, cows were overfed with a view to attaining as high milk yields as possible, and no special attention was paid to whether it was economical, as this was not an important aspect owing to the extremely low price of fodder which was produced by them anyway.

This generous, too intensive method of feeding resulted in those relatively high milk yields that in many places characterized the period discussed. The increasing consumption rate and improved proportion of concentrates can be traced back to this.

Sheep

Sheep farming was generally characterized by an unchanged though improving feeding system, which meant a decided tendency to intensification. This was a natural consequence of the sharp reduction of the sheep stock which eased the strain on the pastures, and resulted in a relative abundance of the specific sheep fodders. In addition, in sheep-farms adjusted to milk production, fodders favourably converted into the ewe-milk and – above all – quickly returned in cash were fed more and more widely. In the inter-war period Hungarian sheep-farms utilized fodder crops that could not be used efficiently in other livestock branches – that is, would have been wasted without the sheep.

For this purpose, naturally, the so-called "bad" pastures were first utilized (alkali pastures, parched bare lands, ravines, roads, banks of ditches, slopes, etc.), furthermore, the so-called occasional pastures (stubble-fields, superabundant crops, artificial winter pastures). It was a well-known fact in those days that the stubble of any field crop was a table set for the sheep. It was known that it was worth feeding the sheep with second-rate bulk feeds since the sheep could pick out the weeds, glumes, broken leaves of straw otherwise unsuitable for feeding purposes, which thereby were almost equivalent to hay.

Thus, while in cattle, feeding served to increase production (milk, meat, draught power), sheep feeding was determined by the chance possibilities of fodder utilization, so its principles were controlled by the business aspects of the farm.

Masting, this old feeding method of pig farming in Hungary, was practically discontinued after the First World War. It lost importance anyway, since the acorned pigs which yielded soft lard and specific tasting pork were no longer sought after in those days.

The situation was different in grazing. The most general form of peasant pig farming – maintaining pigs in herds – remained unchanged. This method maintained in practice even today consisted essentially of the following: early in the morning the swineherd of the village bugled the pigs – and sometimes the goats – from each house, grazed them all day long on the common pasture, then towards evening drove them home where they were given a thin pig-wash composed of kitchen garbage accumulated during the day to supplement – or "compensate for" – the poor grazing ground.

It was, however, not only in small holdings but on large estates too that grazing played an important role in pig farming. At that time the management system for mainly mangalica or crossed pigs was still generally built on grazing, and special attention should be paid here to the extreme importance of stubble grazing.

The essence of pig maintenance and fattening was based, however, on feeding fodders. Of the grain fodders, particularly maize was the most important. At the end of the thirties the dimensions of pig breeding were still primarily determined by maize yields(63).

In the period discussed industrial fattening – manorial fattening was in essentials the same – was divided into three feeding phases. In the first phase bran and barley, in the second barley and maize, while in the third phase only maize were fed(64).

It was in that period that the so-called forced fattening was introduced. The first description of this fattening method developed by *F. Csáky* was published in 1925 in the special journal "Állattenyésztők Lapja". Forced fattening applied to mangalica pigs – an example of fattening of meat-type pigs – was as follows: the fattening of the mangalica piglets began immediately after weaning by a more intensive feeding. The time of fattening was thereby considerably shortened, the risk decreased, and fattening required less unproductive subsistence fodder and other costs (tending, etc.). The better feed conversion of younger animals could be exploited more favourably, and the quality of both pork and lard improved. Thus, through the forced fattening of mangalica pigs more and better quality commodities could be produced with less fodder and in less time. Pigs thus fattened were ready for the butcher with a weight of 160–200 kg when only 13–15 months old. Forced fattening had, however, drawbacks too. According to *F. Kertész* this method did not spread to such an extent as could have been expected. One of the main reasons was that mostly mangalica pigs were fattened in this way, although animals of this breed, when subjected to an intensive feeding procedure, quickly ran to fat and their bones could not develop proportionately to their weight gain, particularly when they were not exercised and the proper balance of mineral

matters was neglected. Only certain strains proved suitable for forced fattening, and only highly qualified breeders were able to prevent the porkers from getting wizened. The other reason was that in many places there were still favourable conditions for grazing the young pigs and utilizing thereby the non-marketable produces of the farm. Under such circumstances forced fattening was not profitable(65).

We have to speak of the importance of a more intensive, protein focussed feeding introduced parallel with meat-type pig raising. The progress made in the field of breeds had a highly favourable influence on the spreading of more up-to-date feeding methods too. Due to this change potato and lucerne in pig feeding were introduced beside skimmed milk, and dairy products in general, and industrial protein feeds (oil cakes, extracted meals, meat meal, crackling etc.).

In those days barley, bran and peas were generally believed to be the most important fodders of meat-type pigs. Advanced breeders fed fish meal prepared from fish of Lake Balaton, meat meal, beer yeast, blood meal, refuse pea and various dairy wastage to the meat-type pigs besides bran. In the meat-type pig-farm of Endrédújmajor horse-meat, mutton, eosinated wheat, crackling, denatured sugar, tropical oil cakes, extracted meal, skimmed milk, cheese scraps and whey were also used for feeding purposes.

Horses

When discussing the feeding system of horses in the inter-war period we cannot speak of any considerable change – either positive or negative – compared to earlier periods.

The horses were fed at that time – according to the rather conservative military prescriptions – mainly on oats and meadow hay even in "civil" horse breeding. Naturally, these fodders were gradually – though very slowly – replaced by maize and lucerne.

Thus feeding of horses was not exclusively determined by economic aspects, but partly by the military principles of horse maintenance adopted by farmers (landowners, farm managers, coachmen, peasant horse keepers) during their military service done mostly at the cavalry. Horses were, anyway, particularly well treated at that time. Those who did not have the necessary means, did not keep horses. Those who did, made every effort to give them everything that was "due" to this animal, all the more so because the owners of horses in bad condition were despised at that time.

Poultry

In the inter-war period feeding systems fundamentally different from one another developed in the poultry branch of Hungary.

One of them was in practice in small-scale – generally called peasant – poultry farming and was primarily based on grazing. Namely, gallinaceans, turkeys

scratch about, pick for scattered seeds, insects, worms, clean up the stubble-fields; the water-birds graze, fish, etc.

The other system was used in the industrial (large-scale) form of poultry farming, where the fowl was kept closed and fed according to the most up-to-date principles of science.

These perfectly different systems were not, naturally, identical with the extensive and intensive forms of feeding, and were not, accordingly, strictly separate either; in many cases the grazing poultry received quite satisfactory, sometimes even too generous supplementary feeding, while the young poultry kept in farms very often was regularly grazed by means of portable hen-houses, destroying thus the harmful insects of the fields.

Preservation and utilization of fodders

Fodder preservation showed a highly favourable trend in the period discussed. Preservation by fermentation is the first to be mentioned. The souring of green fodders was not a new method, *F. Kisszántói Pethe* mentioned it already in 1815.

Beside the hot fermentation aboveground, and pit-storage, preservation by cold fermentation was also introduced later. *I. Rothmeyer* wrote in 1914: "Silage feeding can be considered indispensable in intensive farming"(67). At the beginning of the twenties ensilage was already in the centre of interest in literature(68). In 1924 *S. Konkoly-Thege* thought it advisable to increase the capacity of souring at the expense of hay making(69). In the same year at a farmers' meeting held on 7th December *I. Weiser* spoke about "how to make good quality soured fodder"(70). *A. Zaitschek* wrote a paper in 1925 on "Fodder preservation in silos, stacks and pits"(71) which was followed by a large number of similar studies(72). However, the wide application of the method of ensilage was undoubtedly due to *L. Kovatsits*(73) who worked assiduously and enthusiastically in this field. In his opinion a much larger volume and higher quality fodder can be obtained from the same area at a lower cost than so far(74). In a paper entitled "Ensilage of fodder with special regard to cold fermentation" the question of souring is treated. In "Importance of silo management(75) *Kovatsits* pointed out that by feeding silo maize instead of fodder beet the costs of winter feeding could be reduced by 30–35 per cent. Ensilage is an indispensable supplement rather than a rival of hay making, necessary when feeding is to be made more rational and cheaper(76).

It was also in that period that up-to-date methods of hay drying were evolved. The literature of today seems to avoid this fact, although hay drying on racks was rather usual in those days, mainly on the estates. In the thirties fodder crops grown in the field were dried on tripods in many places, and even the stacks were ventilated in the following way: the roughage dried previously on racks was placed onto double crosses formed from cord wood on the ground, and wool bags were pulled across at the crossing points to form air funnels.

There were several occasions of receiving practical help too. For example

during a campaign some 30 000 Finnish broaches were distributed at a 50 per cent preferential price(77).

It was at that time that feeding on the basis of the nutrient content was widely introduced in practice. The farmers of those times often consulted *Weiser-Zaitschek*'s book entitled "Science of feeding" and it was fashionable to know the starch equivalent and digestible protein content of the major fodder crops by heart.

To say but a few words about developments in this era, it was a highly important realization immediately after the First World War and the revolution that "beside general protein deficiency the animals lived and produced very wastefully"(78).

A. Zaitschek called attention to the fact that oil cake was a cheaper protein source than bran(79). This realization of the importance of protein thus had very useful practical consequences as well, and from that time on this question became prominent.

It was in that period too that the idea of protein supplementation was first raised. The paper "Feed protein completed by ammonia salts" written by *O. Wellmann* and *I. Cselkó* was published(80) in 1916, then *O. Wellmann* wrote a study on "Increasing the milk production of milk-cows by feeding urea"(81) in 1922.

The vitamin problem appeared in practice(82), and so did the question of salt turnover. In the early twenties *Wellmann* widely propagated his research results in this subject, and published a paper on "The turnover of inorganic matters and the calcium requirements of domestic animals"(83). *A. Zajthay (Zaitschek)* wrote about the trace elements for the public(84).

It was in the twenties that the growing of Sudan grass acclimatized by *J. Surányi* began(85), and on the model of the mixture of oats and vetches other fodder mixtures were introduced, e.g. mixtures with hairy vetch, Hungarian vetch, winter pea, crimson clover, and the Keszthely mixture, as well as the mixture of peas and green maize, etc. *K. Ereky* called attention to the importance of "lucerne mash" and "lucerne meal" with the heading "The green fodder mill and the large stable plants"(86).

In 1936 the "Price table of fodders on the basis of feeding value" was a regular column in the "Állattenyésztők Lapja" (Livestock breeders' Bulletin), which was a substantial help for breeders in making calculations.

Considerable progress was made in the technics of feeding as well (e.g. automatic pig feeders)(87).

In the period just discussed the government took institutional measures to lessen the problems of feeding. Larger volumes of maize were imported, transport allowances were made for the delivery of fodders, animals removed from depressed areas with the aim of overwintering were re-transported free of charge, molasses was distributed at a reduced price, the export of rough fodders was stopped, etc.(88).

Summing up what has been said, – in spite of the opinion of the agricultural under-secretary of state of that time that "there are serious troubles with the fodder balance of the country which must be eliminated in the shortest possible

time otherwise livestock breeding cannot develop further"(89)—we have arrived at the conclusion that the inter-war period was a relatively successful phase with qualitative development in livestock feeding in Hungary.

The trend of feeding

Knowing the fact that after the First World War the rearing of ruminants was basic in both manorial and peasant farming in Hungary, we find it natural that first rough fodders, then later meadows and pastures were in the centre of interest.

Farmers of that time produced bulk feeds, particularly roughages, which could be grown at a low cost with simple cultivation methods. In addition, during the economic crisis agricultural produce—particularly those of plant origin—could hardly be sold. It suffices to think of the catastrophic corn prices, the sugar beet contingent, and human foods reduced to mere fodder (eosinated wheat, quality potato used for feeding, feed sugar, etc.). Among the cheap bulk feeds that were totally unmarketable in their original form and could not stand the transport costs it was primarily the rough fodders that could be utilized through livestock farming. So by the use of bulk feeds cattle and sheep—users of otherwise unmarketable produce and producers of abundant amounts of manure—could be reared, and agricultural production maintained at a low cost(90). The draught power required for soil cultivation could likewise be ensured at little cost with bulk feeds. So both soil conservation and soil cultivation became sooner or later dependent on rough fodder production. By this process livestock farming (ruminants) benefited, since it was only in this way that livestock farming in spite of the drop in prices of livestock products below the production costs (especially cattle and sheep breeding, but through their milk products pig breeding too) could not only be maintained but even developed.

The overall development started rather slowly(91). Later, however, during the general crisis—in certain respects perhaps even under its influence—the situation gradually improved as confirmed by statistical data too. Namely, in the years 1930–1934 the increase in sowing area was 0·3 per cent for fodder grains, 3·7 per cent for maize, 7·6 per cent for lucerne and 3·4 per cent for the various clovers compared to the period(92) of 1923–1929.

To outline the trend of feeding in Hungary in the inter-war period a survey of the national fodder balance sheets of the period seems to be a suitable basis(93).

No matter how many errors due to the unreliability of the estimates are found in these tables and calculations, and how different the reports of various sources are, still it is by means of them that a fairly acceptable picture can be obtained of the state of feeding in the inter-war period.

According to *Matolcsy* fodder requirement and utilization expressed in starch equivalent showed the trends to be found in Table 87.

These figures seem to suggest that—in spite of general complaints—demand and supply more or less were in balance.

Period	Requirement	Utilization	Difference
1924/25	59·03	53·58	− 5·45
1926/27	59·38	59·01	− 0·37
1928/29	60·41	57·44	− 2·97
1930/31	59·95	57·08	− 2·87
1932/33	55·13	64·84	+ 9·71
1934/35	59·98	60·33	+ 0·35
1936/37	58·78	69·14	+10·36
1938/39	65·98	71·92	+ 5·94

Table 87.

It is very interesting – indicating gradual improvements in the national level of feeding – that the deficit of earlier years of the period discussed was later on replaced by a surplus. This improvement largely explains the general development of production. A further characteristic feature was the more abundant fodder supply appearing under the influence of the economic crisis, which supports the theory that at the beginning of the crisis farmers made efforts to reorganize crop growing – operated at a loss – in such a way as to render a part of its produce profitable through livestock-farming.

In studying the mentioned balance sheets of fodders the distribution of fodder requirement (Table 88) deserves special attention.

Table 88. Fodder requirement (million q, starch equivalent)

Year	Cattle		Sheep		Pig		Horse		Other animals	
1924/25	29·79	(50·5)	1·09	(1·8)	11·69	(19·8)	14·42	(24·4)	2·04	(3·5)
1928/29	28·75	(47·6)	0·91	(1·5)	13·08	(21·7)	15·28	(25·3)	2·39	(3·9)
1932/33	26·88	(48·8)	0·61	(1·1)	10·81	(19·6)	14·44	(26·2)	2·39	(4·3)
1936/37	27·82	(47·3)	0·85	(1·4)	14·51	(24·7)	13·61	(23·2)	1·99	(3·4)
1938/39	30·08	(45·6)	0·97	(1·5)	18·18	(27·6)	14·48	(21·9)	2·27	(3·4)

The fodder requirement, naturally, depends always on the number of animals, and changes in proportion to it. The percentage share of the different animal species in the fodder requirement shows, however, a much greater differentiation for the period discussed. For example, fodder requirement in cattle farming decidedly decreased, but was compensated by a percentage increase in the requirement of pig farming. The decreasing share of sheep farming was caused by a reduction in the number of sheep. The percentage fodder requirements of other animal species did not show any considerable change.

Table 89. The consumed fodders

Year	Grain	Industrial	Succulent	Roughage	Other
1924/25	17·54	0·41	3·02	11·33	21·28
1928/29	20·26	0·53	2·05	12·15	22·45
1932/33	26·50	0·34	3·27	11·92	22·81
1934/35	22·44	0·49	3·84	11·13	22·43
1936/37	27·74	0·56	4·96	13·24	22·64
1938/39	29·39	0·54	4·54	14·63	22·97

When comparing the two large groups of fodders, the grain fodders and bulk feeds, as well as their proportions with the changes in the number of different animal species, we find the following.

The percentage share of bulk feeds in the total amount of fodders consumed:

1924/25 66·5
1928/29 63·8
1934/35 59·0
1938/39 58·5
1938/39 58·5

The ruminants expressed in standard animal:

1924/25 63·2
1928/29 60·1
1934/35 60·5
1938/39 61·7

The figures in the above comparison prove the repeatedly mentioned qualitative development, since the proportion of bulk feeds showed a higher rate decrease in that period than that of ruminants, that is, feeding shifted towards the use of more valuable grain fodders.

The above conclusion is supported also by data on fodders consumed by the most important ruminant: the cattle.

Table 90.

Year	Number of cattle in standard animal (thousand animals)	Starch equivalent consumed fodder (thousand q)	Starch equivalent per animal (kg)
1924/25	1 513·6	17·95	118·59
1928/29	1 348·8	20·79	143·49
1934/35	1 336·0	22·93	171·63
1938/39	1 504·8	29·78	197·90

Calculation results of the Hungarian Economic Research Institute in the above comparison clearly show the highly significant qualitative improvement of feeding in the period discussed—in spite of the fact that the data were not originally processed for this purpose.

The fodder quantities given by the Hungarian Economic Research Institute in starch equivalent showed that the starch equivalent of grain fodders was about twice as high as that of rough fodders. The maize grain was nearly two-thirds of all concentrates in starch equivalent; barley, oat and industrial fodders were of very low importance compared to it.

The relatively small share of root and tuber fodders is remarkable.

Another conclusion deserves mentioning, namely, that the total amount of hay, feeding straw and maize stalk represented roughly the same starch equivalent as the total amount of concentrates(94).

Let us add that this evaluation throws light on a very serious absurdity. First, the system of feeding – adapted primarily to the prevailing conditions (supplies) – was built on expensive grain fodders of twice the value of bulk feeds. Secondly, the grain fodder consisted mostly of maize. The trouble was not so much that maize had a lower protein content, but that it showed an unprecedented yield fluctuation so that in those days the fodder supply of Hungary was based on a highly unreliable factor.

The thorough study of thousand years of Hungarian livestock farming has taught us the lesson that the proper supply of animals requires not only a sufficient quantity and quality of fodder, but also the highest possible *reliability* of yields. This was partly the reason why years with unfavourable weather conditions had almost catastrophic consequences in Hungary owing to the bad organization, disproportionately small area and neglected state of fodder growing, while in other countries they only exercised a short-lived influence on livestock farming(95).

The 1939 report of the Chamber of Agriculture – when speaking of "unhealthy fluctuations" in maize yields – pointed out that the high fluctuation in crop results made livestock farming risky, as it was mainly based on feeding maize. According to competent professional circles the fodder requirement of livestock-farming in Hungary completely exhausted the total maize yields of years with better yield averages, so in years with lower averages shortages of maize occurred(96).

Apart from the losses of hard years caused by unfavourable weather conditions the difficult situation created a positive aspect that farmers instinctively tried to compensate for the fodder shortage by reducing the number of their animals. This reduction led to the elimination of animals of low productivity, insufficient health, sensitive, of poor feed conversion, sterile, that is, of the least valuable ones.

According to the 1942 report of the Chamber of Agriculture the importance of herd-book registration was also increased by fodder shortage. Namely, under such conditions it was highly important that the limited concentrate supplies were consumed by animals able to convert them with high efficiency(97).

Fodder	Yield	Starch equivalent	Protein value
	thousand tons		
Grain	3 125	2 354	225
Roughage	4 719	1 667	326
Succulent	6 742	1 667	326

Table 91.

Table 92.

	1925/29 thousand	Index	1930/34 thousand	Index
Feed grains	1 225	100	1 129	100·3
Maize	1 875	100	1 944	103·7
Lucerne	291	100	313	107·6
Clovers	270	100	270	103·4

Some further characteristic data and quotations will illustrate what has been said above.

The annual total yields of fodders in Hungary(98) on the average of the years 1931–1940 are given in Table 91.

The proportions of national fodder yields are indicated by comparison of the harvested area(99) (Table 92).

According to a report of the Farm Inspectorate of Vas County clover and crimson clover were the most widely grown fodders at that time, followed by lucerne, green maize, kidney-vetch, etc., while turnip was the most important second crop(100).

However, this was not of course the same in every place. The Farm Inspectorate of Bihar County was – even in 1938 – compelled to report on a very limited lucerne production(101).

According to the 1936 report of the Chamber of Agriculture "the area sown to fodder crops is only 12 per cent of what would be prescribed by a normal rotation system . . . such a low rate of fodder production does not meet the requirements of a rational farming, and does not ensure the necessary manure supply of the rotation system, that is, the most elementary conditions of fertilization . . . In the environs of Kiskunfélegyháza the area of fodder crops is only 0·85 per cent"(102). Even for 1941 the reports account of a very small share of fodder growing in the crop rotation, as well as of a neglect in producing perennial legumes(103).

In addition to theoretical calculations we shall present some exact figures on the fodder export of Hungary at that time, since it reveals the situation of the growing and utilization of fodder crops.

According to the data of *Á. Ujlaki Nagy*(104) the difference of exports and imports was a fodder quantity of about 1·2 million q starch equivalent in the inter-war period. A considerable part of this volume consisted of dried cuttings (0·25 million q starch equivalent), maize (0·24 million q starch equivalent) and fodder barley (0·19 million q starch equivalent).

Of industrial fodders – according to unofficial information – 242 thousand q bran, 158 thousand q feed meal and 44 thousand q oil cake were exported in 1925(105).

Thus the deficiencies of feeding were not, in fact, rooted in a lack of balance between production and utilization, or supply and demand, but rather could be attributed to profitability and commercial reasons.

It can be established, in general, that the science of feeding, and the practice of feeding depending in many respects on the former made a very great progress in the inter-war period in Hungary.

This progress is attributed to two causes.

That was the age when feeding came to be based on biological foundations, and – as a consequence – its most important features corresponding at the level of science, and well proved in practice as well were evolved.

In addition, in that period scientifically supported and adequately propagated up-to-date feeding methods were widely introduced in practice.

Notes

(1) L. Gaál: op. cit. 72.
(2) Ibid. 93.
(3) G. Komoróczy: Nádasdi Tamás és a XVI. századi nagybirtok gazdálkodása (Tamás Nádasdi and large estate management in the 16th century). Budapest, 1932: 84.
(4) L. Gaál: op.cit. 470–471.
(5) Ibid. 166–167.
(6) I. Wellmann: A gödöllői Grassalkovich uradalom gazdálkodása (Farm management on the Grassalkovich estate at Gödöllő). Budapest, 1933: 147.
(7) I. Szántó: Adalékok a magyarországi mezőgazdaság fejlődéséhez a napoleoni háborúk korában (Data on the development of agriculture in Hungary during the Napoleonic wars). Eger, 1956: 502.
(8) G. Bernát: A magyar jobbágyfelszabadítás eszmeáramlatai (Ideological trends of the abolition of serfdom in Hungary). Budapest, 1930: 74.
(9) S. Konkoly-Thege's book "Állattenyésztésünk fejlődésének fő feltétele" (The main precondition of development in Hungarian livestock farming) published in 1920 rightly had the following sub-title: "Proposals on the improvement of fodder production".
(10) Ibid. 22.
(11) Ibid. 34.
(12) L. K. Berger: Keszthelyi keverék (Keszthely mixture). Keszthely, 1904: 35.
(13) A. Kiss: op. cit. 45.
(14) P. Gunst: op. cit. 106–107.
(15) Ibid. 295.
(16) Ibid. 297–299.
(17) S. Konkoly-Thege: op. cit. 90.
(18) Ibid. 69 and 90.
(19) National Archives K 184–10: 8718.
(20) S. Konkoly-Thege: op. cit. 68.
(21) National Archives K 184–10: 42101.
(22) National Archives K 184–10: 51378.
(23) Állattenyésztők Lapja, 1937: 242.
(24) National Archives K 184–10: 8718, 8719.
(25) National Archives K 184–10: 50616.
(26) National Archives K 184–10: 113782.
(27) National Archives K 184–10: 8719 and 38748.
(28) National Archives K 184–10: 35693.
(29) National Archives K 184–10: 63681.
(30) Nationai Archives K 184–10: 8718.
(31) National Archives K 184–10: 8719.
(32) National Archives K 184–10: 25080.
(33) National Archives K 184–10: 102871.
(34) National Archives K 184–10: 25084.
(35) National Archives K 184–10: 39997.
(36) National Archives K 184–10: 8719.
(37) National Archives K 184–10: 25877.
(38) A. Kiss: Állattenyésztésünk belterjességének alakulása az elmúlt száz évben (1857–1957) (Development of intensive livestock farming in Hungary during the past hundred years [1857–1957]). Budapest, 1958: 10.
(39) I. Asztalos: Az állattenyésztés területi megoszlása Magyarországon (Regional distribution of livestock farming in Hungary). Budapest, 1968: 27.
(40) Ibid. 29.
(41) Ibid. 30.
(42) P. Gunst: op. cit. 171–172.

(43) S. Konkoly-Thege: op. cit. 151.
(44) S. Konkoly-Thege: op. cit. 73.
(45) P. Gunst: op. cit. 178.
(46) E. Grábner: Szántóföldi növénytermesztés (Field crop growing). Budapest, 1942: 351.
(47) Ibid. 367.
(48) P. Gunst: op. cit. 152–154.
(49) Ibid. 162.
(50) Ibid. 252.
(51) Állattenyésztők Lapja, 1932: 245.
(52) Ibid. 253.
(53) E. Grábner: op. cit. 863.
(54) P. Gunst: op. cit. 193.
(55) P. Gunst: op. cit. 199.
(56) Ibid. 182.
(57) M. Bittera: Növénytermesztési politika (Policy of crop growing). Magyaróvár, 1937.
(58) E. Grábner: op. cit. 973.
(59) Állattenyésztők Lapja, 1937: 242.
(60) Köztelek, 1921: 1034–1035, and 1923: 1001–1002.
(61) Köztelek, 1929: 1622.
(62) National Archives K 184–10: 50616.
(63) S. Konkoly Thege: op. cit. 179.
(64) Magyarország Állattenyésztése, 1926: III: 31.
(65) Állattenyésztési Enciklopédia, 1959: III: 149–150.
(66) Magyarország Állattenyésztése IV. 29.
(67) Köztelek, 1914: 2034.
(68) Köztelek, 1922: 540–541.
(69) S. Konkoly-Thege: A világverseny és mezőgazdaságunk jövője (The world competition and the future of Hungarian agriculture). Budapest, 1924: 138.
(70) Köztelek, 1924: 1256.
(71) Állattenyésztők Lapja, 1925. IX.
(72) Köztelek, 1927: 155–156.
(73) L. Kovatsits: Korszerű magyar silógazdálkodás (Up-to-date silo management in Hungary). Magyaróvár, 1934.
(74) Köztelek, 1931: 523–524.
(75) Köztelek, 1931: 1082–1083.
(76) Magyar Állattenyésztés, 1930: 271–273.
(77) Országos Mezőgazdasági Kamara jelentése 1944: 73.
(78) S. Konkoly-Thege: op. cit. 153.
(79) Köztelek, 1921: 369.
(80) Köztelek, 1916: 352.
(81) Köztelek, 1922: 1268.
(82) Köztelek, 1928: 1522–1524.
(83) Köztelek, 1924: 1254–1258.
(84) Köztelek, 1942: 422.
(85) Köztelek, 1926: 1577–1578.
(86) Állattenyésztők Lapja, 1932: 178–179.
(87) Köztelek, 1928: 2023–2025 and 1932: 127–128.
(88) Országos Mezőgazdasági Kamara jelentése 1937: 80.
(89) Magyar Állattenyésztés, 1944: 2.
(90) L. Gaál: Az állattenyésztési politika alapjai (Fundamentals of livestock breeding policy). Budapest, 1971: 94–98.
(91) In the fodder seed-grains distributed in 1928 by the Ministry of Agriculture and Chamber of Agriculture hardly any interest was shown e.g. in the counties Komárom and Esztergom (National Archives K 184–10: 8716). In Bácsbodrog County fodder

crop production was only 8 per cent (National Archives: K 184–10: 8718); in 1940 the town of Szeged reported on a "minimum of fodder crops" (National Archives: K 184–10: 521002).

(92) M. Szuhay: op. cit. 40.
(93) The relevant data originate partly from the Hungarian Economic Research Institute, partly from M. Matolcsy and partly from Á. Ujlaki Nagy.
(94) S. Konkoly-Thege: op. cit. 146.
(95) S. Konkoly-Thege: Állattenyésztésünk fejlődésének fő feltétele op. cit. 34.
(96) Országos Mezőgazdasági Kamara jelentése 1940: 40.
(97) Országos Mezőgazdasági Kamara jelentése 1943: 75.
(98) B. Fazekas: Mezőgazdaságunk a felszabadulás után (The agriculture of Hungary after the Second World War). Budapest, 1967: 117.
(99) M. Szuhay: op. cit. 40.
(100) National Archives K 184–10: 51378.
(101) Idem.
(102) Országos Mezőgazdasági Kamara jelentése 1937: 47.
(103) Ibid. 52.
(104) Á. Ujlaki Nagy: Élelmiszertermelésünk és ellátásunk (Food production and supply in Hungary). Budapest, 1943: 243.
(105) Országos Mezőgazdasági Kamara jelentése 1926: 42.

Chapter 18 Animal hygiene

Last but not least we have to speak of the development of animal hygiene as one of the factors enabling and promoting qualitative improvement in livestock farming in the inter-war period.

The development of livestock farming in Hungary occurred along three lines: breeds, feeding and animal hygiene. The breed means, namely, the ability, the feeding the realization of ability, and the animal hygiene the possibility of realization.

Accordingly, veterinary science and the related general development of animal hygiene have always been regarded as highly important.

According to *L. Várnagy* "animal hygiene is a complex of measures taken and institutions established to protect and restore the health of animals – primarily domestic animals –, as well as to protect the health of people in contact with them and with their products, which can be realized through a wide social activity directed by the veterinary organization"(1).

When studying the development of animal hygiene in Hungary we find a fairly large number of data on the epizootics of old times (in 1044, 1059, 1093, 1096, 1189, 1223, 1225, 1233, 1238, 1280, 1301, 1337, 1349, 1433, 1590, 1599, 1603, 1709, 1710, 1712, 1717, 1726, etc.), but only a single reference to their control, namely, when Lodomerius, Archbishop of Esztergom, excommunicated in 1294 the butchers who retailed meat in a secret place, and also the people who bought meat from them(2).

In the 17th century – however unable people were to deal with epizootics – some attempts still were made as proved by the penal decree of 1656 on the punishment of those contaminating the pastures and wells. The Governor-General's Council established in 1723, besides dealing with some special questions of veterinary health, took measures of this kind as well. In 1730 e.g. animals perished of epizootics were ordered to be buried. To prevent the introduction of the cattle plague, trade – and even communication – with Poland and Moldava were prohibited for the counties bordering these countries. The Austrian protective measures taken against cattle plague were extended by the Governor-General's Council in 1731 to include Hungary. Soon after – in 1734 – in places where cases of cattle plague occurred the livestock markets were closed down. According to a statute of 1754, in the case of an epidemic cattle plague, common grazing had to be stopped in the infected villages, cattle was forbidden to be driven from them, infected animals had to be isolated, dead animals together with their hide, buried deep and covered with free lime(3).

Unfortunately, the mentioned orders were not always executed, so their efficiency cannot be established.

The obligatory cattle licence was introduced during the reign of Maria Theresa (1759). The obligation of reporting the diseases and submitting the relevant data in a tabulated form was introduced in those days as well (1762). The orders issued by the Governor-General's Council in 1768 and 1770 essentially repeat and partly complete the mentioned statute of 1754.

It can be established, in general, that from that time on animal hygiene was observed with constant attention, and the necessary orders were issued accordingly.

The 1859 decree of the Austrian Home Office was issued, in fact, with the aim of suppressing the epizootics, and the liquidation of the cattle plague was incorporated as law (Act XX./1874). The general veterinary problems were also foreseen by the law (see the relevant articles of statutes XIV./1876, XL./1879, VII. and XXVI./1880, I. 1883 and XXI./1886).

The statute VII./1888 on the organization of animal hygiene, and its enacting clause (departmental order FIK. No. 40.000) have to be dealt with separately as they were already regulations of general validity laying the foundations of a veterinary administration.

The Act in question regulated the conditions of animal export, declared the cattle licence compulsory, fixed the order of livestock markets, prescribed the obligation of establishing slaughterhouses, the inspection of meat, listed the epizootics to be reported ex officio (cattle plague, anthrax, rabies, strangles, foot-and-mouth disease, infectious pneumonia, genital exanthema, scabies, swine erysipelas), passed an order to control the common pastures, the shepherds, the animal burial grounds, poundmasters, regulated the transport of animals by ship and train. The law provided for the appointment of veterinarians, and prescribed their duties, made arrangements concerning the official veterinaries, and the general veterinary practice and pharmacology, and named the authorities competent in veterinary affairs. The law provided also for the compensation of officially slaughtered animals and repaying of expenses involved by the protective measures.

The law in question contained highly efficient provisions whose beneficial effects were felt in the entire field of livestock farming. For this reason it was in effect for a rather long time, and its eventual replacement by new regulations was only due to the rapid development of veterinary sciences and hygiene.

In the development of Hungarian animal hygiene it was an important milestone when in 1782 Joseph II established a veterinary institute within the framework of the Pest University, which later – in 1851 – functioned separately. It was from this institute that the Hungarian Royal Academy of Veterinary Sciences developed (1890), which in 1899 was raised to the rank of Veterinary College. From 1934 the Veterinary College functioned in the framework of the University of Technical and Economic Sciences, Budapest.

In the inter-war period veterinary management and supervision fell within the competence of the Ministry of Agriculture. The district and municipal veterinaries

performing the duties of the public veterinary service were supervised by the veterinary district inspector and the national inspector general of animal hygiene.

In the development of the Hungarian animal hygiene the role of the veterinary administration deserves special attention, since its importance was best proved by the results of the period discussed.

It was in that period that – among others – the extremely dangerous disease of rabies was eliminated, the damages done by swine-fever, sheep-pox, strangles and anthrax were checked, and the spread of epizootics (e.g. encephalo-myelitis of swine, fowl plague, horse breeding paralysis) from the neighbouring countries prevented(4).

The veterinary administration developed parallel with the general animal hygiene, and was based on the provisions of Act VII./1888 on the general organization of animal hygiene, Act XVII./1900 on the nationalization of the veterinary public service and, finally, on the provisions of Act XIX./1928 on animal hygiene.

For the period discussed the most important provisions were undoubtedly made by the mentioned Act XIX./1928, further by the departmental order No. 99.000. 1932 on its enforcement, signed by the Minister of Agriculture, and finally by the order No. 100.000. 1932 issued by the Minister of Agriculture on the subject of its execution.

According to the general provision of the mentioned Act XIX./1928 the guidance and supreme control of veterinary administration fell within the competence of the Minister of Agriculture (§ 1.). Section II of the Act contained provisions for preventing the introduction of infectious animal diseases.

Section III included regulations aimed at preventing the occurrence of infectious animal diseases. This section dealt first with the cattle licence, then fixed the order of livestock markets, cattle shows and rewards, and of animal transports by train and ship. It prescribed the rules of animal transports by other vehicles, and of driving. It specified the duties concerning disinfecting in the case of transporting animals and fresh animal products. It provided for the inspection of meat, establishment of slaughterhouses, maintenance of dogs, and contained other minor protective measures(5).

Section IV contained provisions for the suppression of infectious animal diseases in two groups (general suppressing orders, and special suppressing orders). The latter concerned the cattle plague, anthrax, blackleg, haemorrhagia septicaemia, rabies, strangles, infectious foot-and-mouth disease, sheep-pox, horse breeding paralysis, genital exanthema, scabies, swine-fever, swine erysipelas, tuberculosis, chicken cholera and fowl plague, as infectious animal diseases compulsorily reported(6).

Section V dealt with the expenses of the suppressing orders, distinguishing the expenses of compensation from other costs of the suppressive measures(7).

Section VI contained provisions for the veterinary practice(8).

Section VII contained the sanctions(9).

The heading of Section VIII was: Provision for the veterinary service. In this

framework the official veterinary service, the duties of municipal veterinaries and those of the Royal Hungarian veterinaries were specified(10).

Section IX included the usual clauses (examination of official veterinaries, earlier provisions cancelled, and designation of the ministries enforcing the law)(11).

The enacting clause of the Act regulated the internal, foreign and transit trade of animals. It dealt with the export and transit regulations of livestock products, the conditions of issuing a cattle licence, the transportation of animals, the livestock markets, slaughterhouses, with the inspection of meat, disposal of carcasses, establishment of animal burial grounds. It provided for the maintenance of dogs, introduced the dog-tax, and enacted that the municipal funds established from the dog-tax should be allowed to be used for animal breeding purposes as well, besides the service of veterinary hygiene, and ordered to use the dog-tax later exclusively for breeding purposes. The Act and its enacting clause regulated the question of vaccinations, the production of vaccines and the control(12).

The mentioned provisions were aimed mainly at promoting the control of infectious animal diseases by establishing quarantines and prescibing their conditions, as well as regulating disinfection and compensation.

To facilitate the general survey, the number of animals perished and slaughtered in consequence of epizootics will be presented in Table 93 as a percentage of the total number of the livestock:

These figures are not, however, unambiguous indicating a slight decline in cattle farming and improvement in the other branches. Therefore the changes in the situation of animal hygiene will now be discussed in some detail.

On the whole, the data show a general improvement of animal hygiene in the period in question. The major—mostly epidemic—diseases are described below.

Year	Cattle	Sheep	Pig	Horse
1922	0·2	0·3	0·4	0·10
1923	0·2	0·3	2·1	0·04
1924	0·2	0·3	2·9	2·90
1925	0·1	0·2	3·8	0·03
1926	0·1	0·4	3·6	0·04
1927	0·1	0·2	2·8	0·03
1928	0·1	0·2	2·7	0·05
1929	0·2	0·2	2·6	0·03
1930	0·9	0·3	3·5	0·02
1931	0·9	0·2	7·6	0·02
1932	0·1	1·8	10·6	0·03
1933	0·9	0·1	4·4	0·03
1934	0·8	1·1	7·2	0·02
1935	0·9	0·2	4·7	0·03
1936	0·9	0·3	2·2	0·02
1937	0·8	0·3	1·7	0·03
1938	0·5	0·2	0·3	0·02

Table 93. Perished and slaughtered animals due to epizootics

Epizootics

To begin with, a relatively large number of works have been published on epizootics (*Veszprémi* 1778; *Ádámi* 1781, 1782; *Tolnai* 1784, 1785; 1799, *Fekesházy* 1789; *Haliczky* 1816; *Pap* 1842; *Zlamál* 1863; *Uray* 1861; *Polya* 1867; *Felletár* 1868; *Róth* 1869; etc.) indicating that not only the authorities but the general public too were deeply concerned with the question of epizootics.

Of the infectious animal diseases occurring as epidemics the most severe ones were fought off rather early. In the inter-war period cattle plague earlier causing serious damages no longer occurred in Hungary(13). It was finally eliminated around 1881, though the fight against this epidemic was not over, as the danger of its re-importation constantly threatened. Even in 1921 there were cases of cattle plague in Belgium, and the Hungarian veterinary organizations were greatly concerned with the Polish epidemic that approached Lemberg. As a reaction, reflecting the great anxiety, in addition to publishing informative papers(14) the whole veterinary organization of Hungary was mobilized.

In a similar way, from 1901 the infectious pneumonia of cattle, then from 1928 the strangles were successfully eliminated. The earlier so dangerous horse breeding paralysis and infectious lymphangitis were also fought off by that time. The elimination of the latter two diseases was due almost exclusively to the veterinary supervision, which sought out the diseased animals as well as those suspected to be diseased or even infected, destroyed them, and officially closed down the infected livestock buildings, farmyards and even whole areas—if necessary.

The realization in practice of artificial immunization proved to be an efficient means in warding off the epizootics. In this regard Hungary was in the first line, as immunization against anthrax was tried out here as early as in 1881—the year of Pasteur's famous experiment in Pouilly-le Fort—and the mentioned experiment repeated, for the first time in the world, under the guidance of the Hungarian *Azary*(15) and with the assistance of *Thuiller* sent to Budapest by *Pasteur*, then extended by vaccinations carried out at Kapuvár.

The vaccines put into circulation in 1907 and used in veterinary practice—on the effect of the results appearing almost perfect—were subjected to official control(16).

Of the other epidemic diseases the greatest losses were undoubtedly caused by the infectious foot-and-mouth disease, liver rot, tuberculosis, swine erysipelas, swine-fever and chicken cholera in the period concerned. These diseases will be discussed separately.

Infectious foot-and-mouth disease (Aphthae epizooticae)

This epidemic disease known ever so long, from time to time swept over Hungary too causing serious damages.

The number of animals fallen ill between 1924 and 1940 are shown in Table 94.

The data of Table 94 clearly show the constant danger of the disease and its highly varying extent.

Two types – a benign and a malignant – of the infectious foot-and-mouth disease were known at that time, according to the course of the disease.

Even the so-called benign foot-and-mouth disease caused in each case serious damages through the fact that sick animals were unable to work (draught power) for a long time, due to fever and lack of appetite they lost weight, the milk of diseased cows could not be properly utilized, and the milk production was considerably reduced until the next period of lactation.

The malignant form of the disease often caused a 50–70 per cent loss of animals.

The control of foot-and-mouth disease was still not adequately developed in the period discussed. The experience that "earlier, when no veterinary policy measures were taken against the disease the epidemic usually ceased when on the respective area all susceptible animals fell sick and the whole stock of animals thus became immune from the epidemic"(17) had the consequence that when the epidemic appeared the farmers infected their animals themselves so that they could soon get over the difficulties caused by the epidemic.

Year	Cattle	Sheep	Goat	Pig
1924	74 315	20 053	123	21 540
1925	117 705	41 160	44	51 031
1926	20 654	5 904	3	8 623
1927	60 890	14 874	—	23 605
1928	51 050	17 942	1	24 510
1929	90 442	23 408	2	24 920
1930	15 145	2 718	—	3 569
1931	20 853	1 192	3	2 165
1932	22 726	129		104
1933	8 252	2 186	3	6 625
1934	702	—	—	—
1935	2	—	—	—
1936	—	—	—	—
1937	—	—	—	—
1938	712 380	213 217	417	335 056
1939	379 885	128 689	1 663	98 641
1940	50 946	11 980	140	6 977

Table 94. Cases of foot and-mouth disease between 1924 and 1940

Liver-rot (Dystomatosis)

In the inter-war period liver rot was not subject to any form of registration, so its changes can no longer be reliably reconstructed.

The rainy weather in 1926 was particularly favourable for the larvae causing the disease, so in the winter of 1926–27 an unprecedented extent of liver rot occurred, especially in Transdanubia.

In the affected villages and towns 124 610 of 899 246 cattle (13·9 per cent) and 104 866 of 748 763 sheep (14·0 per cent) fell sick.

Of the diseased animals 72 079 cattle and 90 613 sheep, that is 57·4 and 86·4 per cent, respectively, were treated with Distol. Of these 1 097 cattle (1·5 per cent) and 1 209 sheep (1·3 per cent) were slaughtered; 1 070 cattle (1.5 per cent) and 2 510 sheep (2·8 per cent) died.

According to a contemporary statement the relatively greater loss of treated animals was the result of the fact that a large proportion of the farmers only had their animals treated when they were completely emaciated and so seriously ill that they could not recover in spite of a application of Distol.

Fortunately, in the severely affected counties the liver rot infection was noticed early in the autumn of 1926, so its control started on a national scale.

The Minister of Agriculture gave a general order to the authorities and veterinaries to start the disease control without delay and to warn the farmers on the expected danger.

Attention was called to the fact that the Distol treatment was much cheaper when given to all animals of a village at the same time. In several places Distol was made available at a reduced price, and for the animals of some poor small holders even free of charge.

The authorities tried to prevent the infection of pastures and meadows and annihilated the hay originating from infected grasslands.

The efficiency of control was inhibited by the indifference shown by the farmers in most parts of Hungary. In many places even a free examination of the animals by the veterinaries was refused. There were farmers who did not even accept free medicines and free veterinary treatment. To overcome these difficulties a nation-wide propaganda was organized (lectures, films, pamphlets, etc.).

To fight off the general distrust demonstrative Distol treatments were carried out in many places to convince the farmers of the necessity of curing and the efficiency of the medicine. Where the propaganda was unsuccessful, these demonstrative treatments attained that many farmers – on seeing that the untreated animals got each day thinner while those treated with Distol slowly recovered – committed themselves to the treatment.

The intensity of the epidemic liver rot of 1926/27 was shown by the high number of liver flukes – 2 531 in cattle liver and 1275 in sheep liver – found by Prof. Marek during the examinations.

Tuberculosis

Tuberculosis infection was mostly found in the manorial stabled dairy farms in contrast to the cattle of small farmers put to pasture in most part of the year.

According to reports of the Budapest slaughterhouse in 1930, 16·1 per cent of the western cattle breeds, 17·4 per cent of the Hungarian breeds; in 1938, 26·2 per cent of the cows of western breeds, 12·7 per cent of the bulls and 18·8 per cent of

the oxen were infected by tuberculosis. At the same time, only 12·2 per cent of the cows, 7·3 per cent of the bulls, but 22·3 per cent of the oxen of Hungarian breeds were found to be infected(18).

Of the slaughtered pigs hardly 2 per cent, while the other mammalian domestic animals very seldom were infected by tuberculosis.

Thus the disease attacked mainly the cattle stock. The above cited slaughter-house data cannot, however, be related to the whole cattle stock of Hungary, since the slaughtered animals were mostly old or sick. According to *Manninger* four-year-old cows were only found tuberculotic in 4·6 per cent, while eight-year-old ones in 33·9 per cent (19).

In spite of this the tuberculosis – beside the infectious abortion – caused more losses than all the other cattle diseases together, it was pointed out at that time by *J. Mócsy*(20).

According to Act XIX./1928 from 1 April 1933 the open tuberculosis of cattle fell under duty of registration. On the basis of contemporary estimates, of the open tuberculotic cases the tuberculosis of udders occurred in 1·5%, while that of lungs in 2–3% of the cattle(21).

According to data of registrations the number of cattle reported to be infected by open tuberculosis showed the following trend:

1933	320	1937	155
1934	246	1938	76
1935	172	1939	114
1936	162	1940	47

In Hungary the so-called Bang-technique was used for eliminating the tuberculosis. This method – started in the last decade of the previous century as a private undertaking – resulted in considerable, though only local successes. Still it was on this basis that the practice of isolating the animals found to be free of infection in the course of repeated tuberculinizations was built. The progenies were also raised in surroundings free of infection. Animals possibly found to be reactive during tuberculinization carried out from time to time in this isolated stock were consequently isolated, so finally some tuberculosis free stocks were formed. The success of the method was greatly enhanced by the healthier management conditions (grazing, runways, frequent sterilization, healthy livestock buildings, etc.).

In the conception of the age "it is not the right way of eliminating the tuberculosis, to improve the state of health of the stock by selling the susceptible animals and buying others, but to increase the number of infection-free animals and improve the state of health, and utilization and breeding value of the stock by raising the healthy progeny of the existing breeding stock"(22).

The efficiency of this method was proved by the fact that on the stud-farm of Mezőhegyes the number of reactive animals fell from 26·6 to 2·8 per cent in five years (1898–1903), although during this period the cattle stock increased by 75 per cent – without any purchase of animals(23).

It is remarkable that as early as in 1918 the Ministry of Agriculture sent a rescript to the National Hungarian Economic Association (62.201/1918) informing the farmers that the cattle culled for tuberculosis could be utilized as beef under favourable conditions, and recommended the elimination of animals displaying symptoms of open tuberculosis, then the isolation of those found to be infected by tuberculinization. According to the rescript infected animals could exclusively be utilized as beef(24).

The importance of tuberculosis control was later recognized by the state too which from the mentioned year of 1930 supported it with considerable allowances(25). According to the established practice farmers who asked for it were given free tuberculin and could apply for the free assistance of an official veterinary in performing the tuberculinization. They were obliged to kill their open tuberculotic animals, isolate those found reactive in the course of tuberculinization, and observe the prescribed or recommended hygienic measures. It was forbidden to sell animals showing a positive reaction from such stocks for maintaining purposes, so as not to spread the tuberculosis in this way.

Such stocks were officially declared tuberculosis-free, and when animals originating from them were to be sold the owners were given a free certificate to testify that they had been found healthy at the time of the last tuberculinization.

Milk originating from such dairy-farms could be put on the market with the indication "state certified tuberculosis-free milk". In accordance with the order issued in 1931 the state institutions (hospitals, sanatoriums, orphanages, universities, and other schools, military forces, etc.) were entitled to give preference to such milk and pay a higher price for it.

After the first year's results of a tuberculosis control carried out with state subsidization 11 000 cattle were subjected to veterinary treatment.

The progress made as a result of the above described method applied from 1931 institutionally, with state support is indicated(26) in Table 95.

Pursuant to the decree No. 52.000/1943 of the Ministry of Agriculture dairy-farms declared tuberculosis-free, further, breeding stocks supervised and directed by livestock-breeding associations were granted a state subsidy. Its extent was, however, determined with the available funds taken into consideration(27).

Year	Number of stocks	Tuberculosis-free		Number of animals
		Number	Per cent	
1930	24	—		—
1931	74	8	10·8	1 524
1932	79	17	21·5	2 939
1933	113	29	25·6	3 959
1934	129	49	38·1	6 042
1935	120	68	56·7	7 562
1936	127	97	76·6	9 089
1937	129	108	83·7	10 870
1938	124	108	87·0	10 891
1939	124	112	90·3	11 607
1940	128	118	92·2	12 446

Table 95. Controlled animals

Swine erysipelas (Rhusiopathia suis)

This disease appearing from time to time – mainly in the hot summer period – in the form of an epidemic caused considerable losses to pig breeders in Hungary too. However, the introduction of vaccinations significantly reduced the losses.

The efficiency of protection can be characterized by the trend of the number of vaccinated pigs(28).

1924	325 555	1933	459 015
1925	325 917	1934	208 782
1926	291 074	1935	584 894
1927	332 580	1936	654 563
1928	357 336	1937	934 352
1929	321 121	1938	909 494
1930	364 225	1939	805 650
1931	385 445	1940	685 579
1932	337 956		

Table 96. Number of vaccinated pigs

Swine-fever (Pestis suum)

Of all animal diseases this disease caused the heaviest losses in Hungary. It was imported into Hungary in 1895 by foreign pigs delivered to the pig market of Kőbánya (district in Budapest). The rapid spread of the epidemic was accompanied by an unprecedented number of death cases all over the country. According to official statistics the number of perished and killed pigs was nearly four and a half million until the First World War – that is, in less than two decades. In 1895 more than ten thousand pigs died of swine-fever in the fattening plants of Kőbánya in June alone.

At the beginning, hardly any protection was found against the epidemic. The initially promising vaccine production experiments based on the otherwise good idea of *H. Preisz* later failed to give the expected results owing to the rhapsodical effect of the reconvalescent serum.

Pig farmers soon realized that the surviving animals of a pig herd attacked by swine-fever would not catch the disease again. It thus became evident that these animals having recovered from the disease were the ones that had to be fattened, and so the price of such pigs exceeded by far that of other pigs. Unfortunately, on account of corrupt practices pig fatteners were unable to fully protect their interests.

In the fight against swine-fever it was a turning-point when in 1906 *F. Hutyra* pointed out experimentally that the new swine disease caused by a filterable virus according to American researchers was identical with the Hungarian swine-fewer. With the pathogen of the disease known an extensive scientific work began, in the course of which *F. Hutyra* and his closest collaborator *J. Kövess* endeavoured to get the pigs surviving the virus vaccination – with a method already known and

applied in producing other sera – into a state in which they were able to carry on vaccination experiments with their blood.

With a view to the success of the experiments pig-farmers made whole herds available for the purpose of experimentation. The experiments were financially supported by the Ministry of Agriculture. The researchers succeeded in producing a serum that protected the infected herds from heavier losses. *I. Darányi*, Minister of Agriculture in that period, realized the importance of protection and promoted the production of a larger quantity of serum by a grant of more than 100 000 crowns. So it happened that the "Laboratory for the Study of Epidemics", later to become the "Phylaxia Serum Producing Company", came to life in Kőbánya.

The essence of the procedure was that beside the serum the virus itself was inoculated into the pigs, so – under protection of the serum – they almost imperceptibly got over the disease and became resistant to further infections.

Kövess rightly wrote the following lines in 1940: "Today pigs of any age and breed can be protected from swine-fever. The piglets are, however, optimally vaccinated when four months old, whereby they acquire protection against swine-fever for life"(29).

Strangely enough, farmers were at that time rather slow in subjecting their animals to vaccination, although in 1931 the Ministry of Agriculture distributed a larger volume of vaccine to inoculate the pigs of poor people in the affected villages with. The counties were authorized to buy vaccine to the debit of the so-called dog-tax fund.

"Vaccination of infected pig herds in 1924 was widely applied, though with varying success. Often the results were surprisingly good, but in many cases death could not be prevented even by vaccinations" – wrote the "Állategészségügyi Évkönyv" (Veterinary Year-Book)(30). Of 600 young pigs of a farm in Győr County 34 per cent perished in swine-fever in the course of simultaneous vaccinations(31). Such cases naturally discouraged the farmers.

It often occurred that even farmers who at last decided on having their pigs vaccinated, retracted from it by the time their turn came. Fortunately, the results were excellent. Vaccinated animals survived almost without exception even when most of the pigs left untreated perished in the same village. As a consequence, the number of sensible farmers applying voluntarily for vaccination constantly increased.

Considering that vaccination was not completely without risk, because the vaccinated pigs temporarily excreted virus, it represented thereby a source of epidemic for untreated animals. For this very reason vaccination was subjected to licence.

Vaccinated pigs usually acquired immunity for life.

Seeing the good results of vaccinations in Hungary similar protection was started all over Europe for which the vaccine was mostly obtained from Hungary. The biggest export markets of Hungary were Romania, Spain and Switzerland, but considerable quantities were exported even to South-America. Before 1927 vaccinations were not institutionally administered yet; they were mostly restricted to larger estates, fattening plants, etc.

The extent and efficiency of vaccination are shown by Table 97.

Year	Vaccination with serum vaccinated	perished (%)	Simultaneous vaccination vaccinated	perished (%)
1927	23 314	11·1	68 965	5·8
1928	70 708	10·6	82 457	4·6
1929	43 031	10·9	108 045	4·8
1930	71 895	9·5	149 485	5·5
1931	123 696	16·0	200 841	3·9
1932	62 912	18·6	377 872	5·0
1933	19 610	15·1	557 872	9·5
1934	26 284	14·8	906 791	7·4
1935	20 702	10·0	697 874	6·7
1936	15 433	9·8	706 393	7·0
1937	11 467	9·0	912 577	6·5
1938	7 321	11·9	981 481	7·0
1939	12 754	16·8	1 067 462	9·1
1940	7 162	11·4	989 353	8·2

Table 97.

Chicken cholera (Cholera avium)

In the inter-war period the results of poultry breeding in Hungary were threatened by the chicken cholera. This disease caused particularly serious losses during the First World War.

The damages caused by this poultry disease were lessened by the application of a vaccine prepared by *R. Manninger* and *A. Szász*; and of other immunizing materials developed later from it.

It is very interesting that according to the Veterinary Year-Book chicken cholera was to a smaller or greater extent widely spread in the country, and the protective and curative vaccinations were ineffective(32). Considering that chicken cholera was not usually reported at that time, it is today very difficult to give a true picture of the situation. Namely, chicken cholera only became subject to registration with the enactment of Act XIX./1928. on 1 April 1933.

The number of fowl fallen ill with chicken cholera was:

1933	27 880	1937	9 062
1934	30 380	1938	8 420
1935	8 718	1939	6 962
1936	3 847	1940	2 485

Rabies (Lyssa)

Rabies has never caused any considerable loss in the livestock, still, being dangerous for humans, has always been in the centre of attention.

By the nature of the thing rabies was to be eliminated mainly among the dogs. The good results were due to prescriptions of Act VII./1888 and Act XIX./1928 as well as to their extremely thoughtful observance.

The vaccination of dogs was first obligatory only in some villages of Pest County (1933), later in Budapest (1935), then it concerned all sheep dogs (1937). Under the influence of favourable results the compulsory vaccination was gradually extended to include the whole territory of Hungary (1939).

The number of rabid dogs showed the following decreasing tendency:

1936	471
1938	128
1939	42
1940	17

Following the extension of compulsory vaccinations over the whole country rabies practically ceased to exist in Hungary (Manninger 1948: 2).

The general situation is shown by Figs. 2–7.

Sterility

Sterility was a rather old problem in Hungary.

The fight against it was started by inclusion of the lecture "Pathology and therapy of sterility" in the 1911/12 curriculum of the Veterinary College.

At a meeting held by the Livestock Breeding and Veterinary Section of the National Hungarian Economic Association on 11th April 1921 *H. Hetzl* dealt at length with the sterility of cattle. About sterility caused by infectious abortion nothing was said to that day, in spite of the fact that this disease was discussed by *Hetzl* in lectures and papers(33) as early as in 1913.

As a response to an increasing number of complaints about sterility *F. Hutyra* published a series of papers in which he informed the farmers on Bang's epidemic and called their attention to the danger of "this disease not recognized and controlled in time may infect the whole stock before long"(34).

He pointed out, further, that each case of premature calving had to be regarded as if it had been caused by infection(35), and emphasized the importance of prevention as "vaccinations against infectious abortion *(brucellosis)* have given very modest results", therefore "it is impossible to eliminate the disease from the infected stocks by vaccinations alone"(36).

In 1928 the National Hungarian Economic Association invited *H. Hetzel* – the best Hungarian specialist on this question – again to deliver a lecture on the control of infectious abortion and sterility. In his lecture – delivered at a meeting of the Livestock Breeding and Veterinary Section held on 23rd March 1928 – *Hetzel* pointed out that the disease was almost exclusively caused by Bang's bacilli(37). At the same time he called attention to the fact that infectious abortion and sterility were like "Siamese twins".

He described the separate calving pen, and isolation in general, as indispensable preconditions of protection, emphasized the importance of the strictest and widest possible application of disinfecting and called attention to the great advantages of sterility tests.

"A few years ago epizootic abortion was thought to be infectious only for cattle, but recent research and the practice, too, have proved that pigs may also fall ill with this dangerous disease" – wrote the Köztelek(38). This paper was followed by several others in the same year indicating that the question was extended to the field of pig breeding.

Other diseases

In spite of the fact that the losses caused by anthrax and blackleg were not so heavy as those caused by the above described diseases, they should be discussed here as their damages in the period in question were not to be belittled.

Anthrax, primarily a disease of humid regions, occurred sometimes sporadically, and sometimes as mass infection. Special attention was paid to it, as a disease generally known to threaten human health as well. Its control – partly by active, partly by passive and combined immunization – reduced the number of anthrax cases to 1000 animals a year.

The *blackleg* (Gangraena emphysematosa) was not dangerous for humans, pigs and horses. Its latency was not reliably clarified at that time (viable spores in the soil). In the inter-war period recovery attained with blood serum was extremely expensive, so the therapy was confined to the treatment of symptoms. At the end of the thirties the occurrence of blackleg did not usually exceed 300–500 cases a year.

Cattle plague (pestis bovina) and *infectious pneumonia* (pleuropneumonia contagiosa bovum) were diseases no longer existing in the inter-war period; *strangles* (malleus) only occurred in very few cases and in ever decreasing number, while *haemorrhagia septicaema* (pasteurellosis bovum et bubolorum) only in the twenties, and even then was a rarity.

The *sheep-pox* (variola ovina) was a rather wide-spread disease generally affecting more animals than shown by contemporary records. Beside emergency vaccinations administered by the veterinary, preventive vaccinations were mostly carried out by the shepherds themselves whereby the epidemic was practically contained. At the same time in Germany preventive vaccination was already forbidden which resulted in the total elimination of sheep-pox. *Scabies* caused losses in sheep-farms especially in the eastern part of Hungary. In the period concerned successful prevention could hardly be spoken of. The horse *breeding paralysis* (exanthema coitale paralyticum) and the *genital exanthema* (exanthema coitale vesiculosum) – though two different diseases – were listed in the same column by the order prescribing the duty of registration. The horse breeding paralysis was already fought off at that time and only occurred temporarily in two counties in 1921. The genital *exanthema*, on the other hand, – with the prohibition on mating carefully observed – did not cause any considerable loss.

The most important events in the development of veterinary science in Hungary

Apart from the establishment of a veterinary organization developments in animal hygiene were primarily promoted by the introduction of vaccinations. In this respect *Hutyra–Kövess*' swine-fever antibody was an important Hungarian achievement.

Another Hungarian result was the *Hőgyes* vaccination against rabies which modified *Pasteur*'s classical method by employing dilution instead of desiccation to attenuate the effect of the virus. *Hőgyes*' method was later introduced in other countries too.

An effective medicine was discovered by *J. Marek* against liver fluke. The drug first called Kamela was used mainly for sheep; later, when introduced in general use under the name Distol, it proved to be the most important means of protection against this disease.

The organization of an institutional fight against tuberculosis, infectious abortion – and its concomitant: sterility –, as well as the practical introduction of general hygiene were also important events of that period.

Veterinary science was of great help in the field of feeding too by clarifying the disorders of salt turnover and establishing the proper use of vitamins.

The development of veterinary science in that period was connected with the names of some world-famed Hungarian scientists (*Aujeszky*, *Azáry*, *Hutyra*, *Kotlán*, *Manninger*, *Marek*, *Mócsy*, *Tormay*, *Urbányi*, *Wellmann*, etc.).

Veterinary administration

According to general opinion in those days the duty of the veterinary administration was to determine and take steps aimed at protecting the health of the livestock promoting thereby the development of overall hygiene, improving management conditions and fighting off the epizootics. In short, the veterinary administration was expected to protect the livestock of the country from diseases, and from damages caused by improper conditions ensuring thereby an adequate level of public health.

The earlier cited laws of animal hygiene and the orders regulating their enforcement endeavoured primarily to prevent the introduction of epizootics in Hungary. With this in view, the import or transit trade of animals affected – or suspected to be affected – by some infectious disease were forbidden. From countries with which no such agreement had been concluded, animals, animal products and objects possibly suitable to propagate animal diseases were only allowed to be imported, or transported through Hungary with a special departmental licence and under conditions specified in it. In the case of a satisfactory intergovernmental agreement concluded those specified in it had to be strictly observed (veterinary control carried out at exclusive border stations appointed by mutual consent,

certificates of origin of the consignments, observance of temporary import and transit trade bans, etc.).

In order to diagnose the disease in time and take the necessary preventive measures a general livestock licence obligation was in effect, according to which the owners of animals had to provide the animals with livestock ownership papers when selling, driving or transporting them, or having them slaughtered for public consumption. In addition, irrespective of the above, a livestock licence had to be taken out for each horse over two years.

The livestock licence was an official document certifying the ownership concerning the animal in question. It further certified that the selling, transporting and driving within the given term (usually 14 days) of the animal concerned did not violate the veterinary regulations. The introduction of the livestock licence thus prevented the trade of diseased animals – or those suspected to be sick – and made it possible to locate the source of diseases possibly appearing later.

The regulation of livestock markets also fell within the competence of the veterinary administration. Livestock marketing in Hungary was only allowed in surrounded, suitably equipped (office to handle the livestock licences) public market places licensed by the competent veterinary authority. Animals furnished with livestock licence were driven to these market places through entrances assigned for this single purpose, where they were examined by the appointed veterinary.

Particularly strict rules were applied to cattle-shows, rewards, demonstrations, etc.

The veterinary administration controlled the transportation of animals (driving, train, lorry, ship). The animals were placed – after a careful veterinary examination – in suitably disinfected transporting facilities at specially equipped loading stations assigned for this purpose, and transported to destinations determined in advance.

The veterinary administration had the very important duty of controlling the meat, partly to detect hidden diseases, partly to establish its suitability for consumption. The inspection of meat took place in the official slaughterhouse of the town. Where no such establishment was available the butcher slaughtering animals for public consumption was obliged to provide for a private slaughterhouse where the inspection of meat was performed by a veterinary (physician, or occasionally a qualified meat-controller).

An important further task was the burial and destruction of the carcasses or parts of perished or killed animals. This was carried out partly on animal burial grounds assigned and "equipped" for this purpose by digging them after a previous burning or disinfecting deep into the ground, or occasionally by destroying them in cremators or refuse burners. In addition, with special permission carcasses could be made harmless by burying them in dumbwells.

A very important method of prevention – thoughtfully applied by the veterinary authorities – was to take the census of animals grazing on common pastures every spring, before they were put to pasture, according to prescriptions of the rural police, and submit them to a veterinary examination.

The control over vaccinations and the production of vaccine fell within the competence of the veterinary administration. In the case of certain diseases official permission was required to carry out the vaccination, while in other cases the vaccination had to be reported. Vaccinated animals had to be isolated from untreated ones. In the case of certain diseases (anthrax, blackleg, rabies, later on swine-fever) vaccination was ordered by the authorities. Vaccination was only allowed to be performed with vaccine licensed by the Ministry of Agriculture. The trade of vaccines was controlled by the National Veterinary Institute.

The official duties of the veterinary management included also registration and control of milking animals, examination of private stallions, supervision of animal hospitals and veterinary laboratories, control of castration and gelding, etc.

Beside the arrangements serving for prevention the veterinary administration had another important task: to enforce the repressive provisions. The latter included veterinary quarantine, isolation, restrictions on trade, suspension of commong grazing, exploration of the disease's origin, registration and control of diseased animals and of those suspected to be sick or infected, furthermore, authorizing, ordering and controlling the vaccinations, in exceptional cases —to accelerate the course of the disease—carrying out artificial infection, slaughtering diseased animals and those suspected to be sick or infected, closing up markets or restricting marketing, disposing of carcasses as well as of manure and infected litter removed from stables of diseased animals, carrying out and controlling the disinfecting operations, etc.

Compensation for owners of officially slaughtered animals took place also within the scope of authority of the veterinary administration. The assessed damages were paid for by the state.

The professional service of veterinary management was attended to by veterinaries.

Beyond the general veterinary organization two institutions, the Royal Hungarian Veterinary Institute and the National Veterinary Council, are worth mentioning. All scientific examinations and supervisions which went beyond cognizance of the practising veterinaries came within the activities of the former. The latter, the National Veterinary Council, was the advisory organ of the Ministry of Agriculture.

Table 98. Civil veterinaries

Year	Official	Private	Other	Total	Area sq. km. per veterinary	Number of standard animals per veterinary
1924	619	250	—	869	106·9	3 451
1927	674	322	—	996	93·3	2 613
1930	729	340	—	1 069	86·9	2 179
1933	725	444	—	1 169	78·6	1 708
1936	748	472	13	1 233	75·3	1 891
1939	876	398	3	1 277	91·4	1 759

Act X./1923 – though not directly connected with the veterinary administration and containing mostly legal rules of livestock trade – deserves special attention, because it was intended almost exclusively to remedy the abuses originating from the trade of diseased animals.

According to the above law the seller was responsible for deficiencies and disadvantages of the animal, that is, for such defects appearing within a fixed term – usually six weeks after selling – which had existed at the time of the delivery, and as a consequence of which the animal perished, was emergency slaughtered or considerably decreased in value. Some of these defects were so-called redhibitory defects specified by the law, such as: tuberculosis, pseudotuberculotic enteritis in cattle; sheep-pox, scabies, liver fluke, lungworm in sheep; erysipelas, swine-fever, trichinosis in pig; broken wind, paralysis laryngis, staggers, moon-blindness, strangles in horse.

The warranty law brought about order in the trade of animals, and – in addition – increased the prestige of veterinaries active in the enforcement of orders.

To sum it up: The high level and successful development of animal hygiene in Hungary was primarily characterized by the repression of epizootics. The results attained in this field were undoubtedly preconditioned by the institutional work of highly qualified veterinaries, and made possible by the organization and system of veterinary management.

Notes

(1) L. Várnagy: Az állategészségügyi igazgatás fő kérdései (Major problems of veterinary administration). Budapest, 1965: 9.

(2) B. Szepes: A magyarországi állatjárványok és az ellenük tett hatósági intézkedések vázlatos története (Brief history of epizootics and their official control in Hungary). Budapest, 1942: 8.

(3) Franciscus Xav. Linzbauer: "Codex Sanitario-Medicinalis Hungariae."

(4) L. Várnagy: op. cit. 26.

(5) Under provisions of the law (§ 5) horse, ass, mule, cattle, buffalo, sheep, goat and pig had to be furnished with a livestock licence by the owner if he transferred the right of possession of the animal to another person; drove or transported the animal to market, cattle-show or rewarding; transported the animal by train or ship; drove the animal to the area of another village or town; and if the slaughtered the animal for public or private consumption.

The law prescribed (§ 8) that livestock markets or shows were only allowed to be held on properly equipped market places under an adequate veterinary control. According to provisions of the law (§§ 12, 13, 14, 16, 18) in the case of transporting horse, ass, mule, cattle, buffalo, sheep, goat and pig by train or ship the following rules had to be applied:

1. Animals could only be loaded after they had been examined by the appointed veterinary.

2. It was forbidden to place animals from foreign countries in a waggon or cargo space where home-reared animals were transported.

3. Animals from foreign countries could only be unloaded with a simultaneous examination by the veterinary on duty.

The law named the stations that the railway and shipping companies had to transform into loading stations for livestock and supply with the necessary equipment, and prescribed what means had to be used for loading at stations other than those marked out for loading.

For the examination of animals loaded and unloaded veterinaries were appointed.

To transport horse, ass, mule, cattle, buffalo, sheep, goat and pig coming from other countries by facilities other than train or ship and drive them together with home-raised animals was forbidden.

Waggons, ships and cargo spaces used for the transportation of animals, as well as the equipment belonging to them, had to be cleaned and disinfected after each transport, and so had the loading bridges, platforms and loading places.

According to the provision of the law (§ 22) cattle, buffalo, horse, ass, mule, sheep, goat and pig marked out for public consumption, furthermore, cattle, buffalo, horse, ass, and mule marked out for private consumption had to be examined before and after slaughtering from a sanitary point of view.

The law ordered the establishment and maintenance of slaughter houses (§ 23).

The law prescribed (§ 31) that carcasses or parts of carcasses that could not be used, sold or circulated in a natural state had to be rendered harmless.

It was further prescribed (§ 32) that the villages and towns had to provide for an animal burial ground of adequate size, and the municipal boroughs—in addition—for the establishment and operation of a dog pound each.

(6) According to the provision of the law (§ 40) the owners of useful domestic animals (horse, ass, mule, cattle, buffalo, sheep, goat, pig, poultry, dog, cat), and those who were commissioned by the owners of animals to take care of, or tend such animals, were obliged to report at once to the veterinary authorities such animals owned or cared for by them as having fallen ill, which were suspected to be ill or infected with infectious animal diseases subject to duty of registration and described as to their symptoms by the order of the Minister of Agriculture, as well as their death or slaughter due to any disease, and the relevant circumstances. The same persons were obliged to isolate such animals and carcasses till the necessary steps were taken by the authorities, to prevent the spread of the disease.

Veterinaries, meat-controllers, poundmasters, cutters, sowgelders, and all those professionally engaged in slaughtering animals (butchers, slaughterers of sheep, poultry, etc.) were also obliged to report at once if in the exercise of their duties they had learned about diseases, suspected diseases or infections as well as about the deaths (slaughter) of useful domestic animals before the necessary steps were taken by the authorities.

The law made it possible (§ 44) to order quarantine, isolation, restriction on animal trade, reduction in public transport, further, to maintain common grazing on a certain pasture area, common use of wells, drinking fountains, horse-pond, public roads, baulks, free running about and roaming of domestic animals. It regulated the tasks of investigation, observation and registration, the various protective and curative vaccinations, artificial infection, possible slaughtering of animals, destruction of objects, materials, etc. spreading the disease, disinfection, etc., and offered a possibility for closing town markets, shows, auctions and suspend mating, etc.

The law ordered the appearance and termination of epizootics subject to duty of registration to be published. It specified, further, the special repressive measures to be taken in the case of such diseases.

(7) According to the provision of the law (§ 76) for horses, asses, mules, cattle, buffaloes, sheep, goats, pigs and poultry officially slaughtered or which perished as a consequence of official vaccination, as well as for objects destroyed by order of the authorities —except manure—compensation was granted by the state, paid within 30 days after the legally binding assessment of damages.

The state treasury bore (§ 85) the total costs of armed forces ordered to ensure local or regional quarantines; the daily fees and travelling costs of veterinaries, the expenses

of detecting diseased animals and those suspected to be sick or infected; and the costs of materials used in diagnostical procedures, etc.

(§ 86) Costs involved with quarantining and isolating the animals of local landowners; those originating from quarantined places or areas watched by civil guards or policemen; costs of marking out and registering diseased animals as well as those suspected to be sick or infected; wages of the personnel assisting in diagnostic procedures, artificial infection, slaughtering and dissection of animals; expenses of disinfection ordered by the authorities; costs of destroying carcasses, parts of carcasses, litter straw, manure, refuse and other objects—were also met by the treasury.

(8) According to the provision of the law (§ 91) only those were entitled to practising as veterinaries who had veterinary diplomas acknowledged to be valid in Hungary. Veterinaries entitled to practice could not be limited in applying medical procedures, but as to their activities they were under state supervision, and for the blunders committed by them were financially responsible as well (§ 95).

(9) The law specified the penalties concerning minor offences, delicts, derelictions, emphasizing that the persons who deliberately violated the regulations concerning the introduction and propagation of cattle plague were liable to imprisonment up to three months.

If in consequence of the Act a ruminant fell ill with cattle plague, the penalty was imprisonment up to one year. Attempts were liable to be punished as well.

(10) See later the chapter on veterinary administration.

(11) According to the provision of the law the would-be municipal veterinary officers and Royal Hungarian veterinaries passed their examinations before a "municipal veterinary examining board" organized in Budapest (§ 118).

(12) Decree No. 100·000/1932 of the Royal Hungarian Minister of Agriculture.

(13) In the 19th century cattle plague was still a constant threat to Hungary. During the 1848–1849 war of independence this disease flared up again and caused heavy losses. From 1848 to 1865 some 350 thousand animals were killed by the disease. It is worth mentioning that the first vaccinations against cattle plague in Hungary were efficiently applied by I. Havas, veterinary in Tolna County, already in 1838. Similar vaccinations were carried out in Torontál County by V. Zlamál in 1839 (L. Gaál: op. cit. 412–413).

(14) Köztelek, 1921: 68–69.

(15) Á. Azary.

(16) Decree No. 5400. F. M.

(17) R. Manninger: A háziállatok fertőző betegségei (Infectious diseases of domestic animals). Budapest, 1939: 351.

(18) R. Manninger: op. cit. 166.

(19) R. Manninger: A háziállatok gümőkórja, mint az ember gümőkóros fertőződésének forrása (Tuberculosis of domestic animals as a source of tuberculotic infections in humans). Budapest, 1940: 3.

(20) J. Mócsy: A gümőkórirtás gazdasági vonatkozásai (Economic implications of tuberculosis control). Budapest, 1935: 257.

(21) R. Manninger: A háziállatok gümőkórja, mint az ember gümőkóros fertőződésének forrása 4.

(22) J. Mócsy: op. cit. 259.

(23) R. Manninger: Az emlősállatok gümőkórja elleni védekezés, különös tekintettel közegészségügyi jelentőségére is (Tuberculosis control in domestic animals with special regard to its importance to public health). Budapest, 1954: 139.

(24) Köztelek, 1918: 436.

(25) Decree No. 83.000/1930 F. M.

(26) Köztelek, 1931: 970.

(27) Köztelek, 1943: 625.

(28) For lack of reliable data Table 96 does not contain the number of animals having perished after vaccination, but since death cases among vaccinated pigs were very rare

at that time, the redoubled number of vaccination unambiguously proves the efficiency of protection.

(29) Trianoni Magyarország Mezőgazdasága, 1940: 812–813.
(30) Állategészségügyi Évkönyv, 1924: 76.
(31) Állategészségügyi Évkönyv, 1924: 77.
(32) Állategészségügyi Évkönyv, 1924: 87.
(33) Köztelek, 1913: No. 73, 75, 77.
(34) Köztelek, 1922: 453–454.
(35) Köztelek, 1922: 480.
(36) Köztelek, 1922: 510.
(37) Köztelek, 1928: 755.
(38) Köztelek, 1926: 30.

Chapter 19 Management of livestock breeding

From the point of view of livestock farming the inter-war period was of special importance as it was in those days that the views and patterns that provided an increased possibility of state and social control over livestock farming crystallized.

Namely, during the First World War the economic life – and livestock farming with it – had to be taken under a closer control. It was during this war economy that the institutional forms, methods and means of state control evolved, among others, in the livestock branch too.

In addition, both the importance and advantages of the state and social guidance of livestock breeding were luckily realized and dealt with on a scientific level in time. Through this the discipline of a so-called "livestock breeding policy"(1) developed in Hungary which was not only theoretically defined, and the relevant body of knowledge adequately explored, but its rules were also used in practice whereby its essentials, methods and means could be empirically studied(2).

In the inter-war period attempts to solve state and social guidance in livestock breeding were made in the following ways:

– by influencing the prices of livestock products;
– by carrying on market research creating and exploiting thereby the best possibilities of marketing;
– by exploring and modernizing the means and methods available for guidance;
– by creating the financial conditions required for all this.

The state – with the assistance of social organizations – endeavoured above all to keep an eye on livestock farming and breeding. On the basis of the notion thus formed of the general situation progressive steps could be taken in several fields.

At the beginning of the twenties – in the period of rebuilding and reorganizing the new country – the exploitation of possibilities offered by the world market seemed to be self-evident, and the first attempts of state guidance were, accordingly, to ensure the market through intergovernmental contracts. In post-war Europe these attempts did not intially encounter any special difficulty, but later on, under the depressing conditions of the economic crisis they merely aimed at maintaining the price level. Namely, through the export, internal prices could be influenced as well.

Of the means employed by the livestock breeding policy of the period in question the administrative measures, financial factors, intellectual guidance and encouragement of breeding and research are worth being emphasized.

These were applied, of course, in the framework of carefully chosen methods,

so the object of breeding selection, the development organizations, further, of cattle shows, competitions, prizes, etc. as well as of the activity promoting different preferential breeding animals should be discussed.

Unfortunately, hardly anything can be said of the past of the Hungarian livestock breeding policy, as a new independent branch of science, although with the introduction of state control and activity of social organizations it was always and everywhere rather effective.

The history of livestock farming in Hungary may be divided into three large parts: livestock farming in the historical, after-Trianon and the socialist Hungary.

Livestock farming in the historical Hungary – more precisely in the Carpathian Basin – had two phases.

In the first phase – from ancient times to the middle of the 18th century – it was mere *animal maintenance*, primitive, natural, based mainly on pasturing on vast grazing lands independent of crop growing and without any upper guidance, suffering from continuous wars, internal struggles and the resulting uncertainty.

In the second phase – to the breaking up of the economic unity of the Carpathian Basin – with the introduction of manorial farming tending toward commodity production, and slowly becoming capitalistic, both the manorial and peasant livestock farming were gradually placed under state control, and – as a result of the ever decreasing and deteriorating pasture areas – connected with crop growing and adjusted to the demands of industry and trade; in a word, livestock breeding was ruled by human intellect and knowledge(3).

Both phases were characterized by a more or less uniform pattern of livestock farming and breeding even under the Turkish rule when Hungary was divided into three parts. This period of a thousand years terminated with the breaking up of the Carpathian basin when in consequence of the First World War new tendencies began to take shape.

The periods mentioned are distinctly separated with animal maintenance dominating in the first, and animal breeding in the second.

As for the "animal maintaining" period hardly any upper guidance, that is breeding policy, can be spoken of. The institutional, direct intervention only appeared in the "animal breeding" period, in the middle of the 18th century.

It was, in fact, in the age of capitalism that Hungarian livestock farming having advanced from primitive animal maintenance to a higher stage of animal breeding arrived at the threshold of a developing breeding policy.

The Hungarian livestock breeding policy endeavoured to produce the largest volume, best quality and cheapest possible products primarily by the utilization of domestic availabilities. Its development and effectuation obviously required stable social conditions and a high level of scientific knowledge, since it was only able to promote the improvement of the livestock branch when based on coordinated interests of government and farmers, rational organization and joint work.

All this required such a scientific level, comprehensive economic approach taking all aspects and relations of livestock breeding into consideration that was only brought about by the appearance and strengthening of the capitalist system.

That is why evolvement of the livestock breeding policy coincided with the birth of this social form. Its rules, forms, means and ways of application are therefore to be found in that age. It was only in the 19th and 20th centuries that livestock breeding policy was raised to a scientific level, and agrarian history, economics, agricultural policy, agricultural sciences, production planning, interest management amalgamated into a new discipline.

Livestock breeding policy was very difficult to effectuate in Hungary even in the brightest period of capitalism due to the confused conditions of landed property and ownership.

Its importance was realized rather late in spite of the fact that in many places livestock farming – in accordance with the development stage of the period – recognized the necessity of introducing a purposeful scientific level of animal breeding in order to develop a new type of livestock ensuring a higher volume and better quality production on the smallest possible area and at the lowest possible cost. All this required, however, means available only at a certain stage of development.

Breeding policy thus could not play any role in agriculture until the difficulties of war economy made the authorities realize its importance and advantages.

This realization – however late in Hungary – was very early on a world scale, since *S. Konkoly-Thege* taught this subject as early as in 1920. In his work "Development trends, means and results of livestock breeding in Hungary" containing the lectures delivered, the author rightly said: "I am perhaps not too immodest when pointing out that a similar kind of detailed and comprehensive treatment of the subject matter of livestock breeding policy – together with a discussion of the related questions – has not been published either in Hungary or abroad"(4).

Means of livestock breeding policy

Administrative means (laws, orders, etc.)

The government endeavoured to perform the guidance of livestock breeding, and through this influence its development, in the most obvious and easiest way: by laws, in the inter-war period as well.

The most important laws made in the period discussed were built on the relevant laws and orders of pre-war Hungary, first of all on Act XII./1894, Act XLVII./1895, Act XLIII./1908 and Act X./1913

Act X./1923 was already a law regulating the question of livestock trade warranty making order thereby in the field of animal trade.

As for the veterinary and breeding control of sires for common breeding, provision was made by Act XXV./1927 which prescribed that only sires furnished with appropriate certificates could be used for common breeding, and defined at the same time the concept of common breeding. Accordingly, under provisions of the law any mating of animals owned by different persons has to be regarded

as common breeding, except when the owner gives his sire used for his own dams over to his employees engaged with the reservation of maintaining animals for the purpose of covering their dams (§ 5).

From the point of view of livestock breeding Act XIII./1940 was very useful; it prescribed that the municipal authorities were obliged to establish livestock breeding funds (§ 1), that to the debit of the municipal livestock breeding funds only officially registered sires suitable for common breeding could be purchased (§ 4). This Act made provision for the conditions of handling and utilizing the mentioned municipal livestock breeding funds too.

Of the provisions of Act XVI./1942 – the so-called agriculture-promoting law – the one allocating 186 million pengős in ten years for purposes of livestock breeding closely affected the livestock branch (research, model farms, competitions, shows, meadow and pasture management, herd-book registration, breeding stock farms, etc.). This Act authorized the Minister of Agriculture to ordering a regular veterinary and breeding control of dams used in common breeding, as well as the examination of sires used in private breeding as defined in Act XXV./1927 (§ 29).

The mentioned laws and orders were based on a rather correct judgement of the situation, and the objects were carefully set. They offered a possibility of practical application and their results were mainly due to the fact that – in general – they were readily accepted by the farmers. The provisions of the laws were approved of by those executing them too, who tried to enforce them ambitiously.

In order to eliminate the drawbacks of bureaucracy the provisions were made in such a way as to make their execution as comfortable for the officials as possible. To give a good example, the Ministry of Agriculture made the municipal livestock breeding laws easy to frame by issuing a model law whereby the work of municipal clerks was not only easy but also rather comfortable.

Another step more or less belonging to the administrative means was to furnish the livestock products with quality marks. But from the point of view of livestock breeding policy this branding – as it is called – was much more a financial factor.

Financial factors (price policy, support, etc.)

In the inter-war period those competent to deal with the question were aware of the fact that material interest and its proper guidance were undoubtedly the most efficient and successful means of having control over livestock breeding. They knew it perfectly well that anything the state wanted the subjects to do first had to be made profitable.

Price policy was more or less properly appreciated though its possibilities were not fully exploited.

Influence exercised on the export and import, customs policy, state purchases, etc., were the means of the price policy.

A rather efficient solution of a difficult task was the case when in consequence of the applied price policy the volume of such readily marketable products as particularly important for the state was successfully increased. In the period dis-

cussed the government tried to achieve that all supports of financial character reached their place of destination. This aim was not naturally fully attained, since industry and trade always had their profit from the material means allocated for the development of livestock breeding.

The price policy of the period achieved that in the field of livestock farming the price system was – or at least seemed to be – rather constant.

The afore mentioned branding – that is, furnishing of livestock products with quality marks – though partly belonging to the administrative means was, in fact, a financial factor. Namely, since any product qualified by branding (trade-mark) generally was of higher value, its effect was felt in certain respects as a financial factor. Of the agricultural products of Hungary the dairy products were first branded (Act X./1925). The introduction of the branded butter and establishment of the State Controlling Station of Dairy Products were greatly approved of at that time. Qualification had the great advantage of improving sooner or later the quality of branded products.

Intellectual guidance

Intellectual guidance was a relatively cheap – but in certain cases highly efficient – method of breeding policy, which through the means of communication (press, lectures, congresses, later the radio, etc.) but most efficiently through teaching, advising (milk controllers) and the technical literature had an influence on the progress of livestock breeding.

Considering the thirties when in spite of the depressing conditions of the economic crisis, the deficit of milk production caused by the industrial milk prices, Hungarian cattle breeding made a considerable progress under the influence of a proper intellectual guidance [livestock breeding associations, Köztelek (a technical paper), agricultural academies, Állattenyésztők Lapja (a journal on livestock breeding), etc.] – and naturally with the background of a favourable price gap –, we have to consider this efficiently applied means of breeding policy as particularly important.

The efficiency and results of this intellectual guidance are rather well known. Yet, we should like to emphasize the importance of the agricultural academies, as the sources of scientific knowledge in livestock breeding. After the turn of the century five agricultural academies functioned in Hungary: at Magyaróvár, Keszthely, Debrecen, Kassa and Kolozsvár. In these educational institutions the students learned livestock breeding and the indispensable related sciences at the highest level, so the number of highly qualified valuable experts of livestock breeding was gradually increasing. The subsequent qualitative improvement was mainly due to this fact. Knowledge is the supreme power in livestock breeding too, and the Hungarian agricultural academies wholly fulfilled their tasks in this regard. The influence exerted by an expert of college education in practice was eloquently proved by the data of surveys made subsequently of livestock farming, livestock breeding and animal products.

Interest in livestock breeding

In the development of livestock breeding a decisive though not sufficiently appreciated role was played by a renewed interest in livestock breeding evoked and encouraged by the current breeding policy.

The concept was formed by *S. Konkoly Thege* who was the first to point out that mere profitability did not always yield the expected results in livestock breeding. In his opinion "an adequate political, social and economic atmosphere is indispensable for this, an efficient livestock breeding activity being a function of numerous highly important factors"(5).

What is entailed is some kind of keen interest, ambition, endeavour which is a very consistent and efficient effort concealed in human nature. The interest in livestock breeding can be regarded as a sort of "hobby", which – if sometimes perhaps too enthusiastically – always was positive. The contemporary farmers – large- and small-scale ones equally – who wanted to excel by their livestock breeding activity at national and local cattle shows did it for pleasure too, so from this point of view it was a true "hobby".

Some examples will illustrate this. It was indeed an interest in breeding, or at least its result that – according to Anonymus – "Arpad, leader of the Hungarian conquerors . . . ordered his horses overridden for many days to be taken there to graze. He subordinated his grooms to a very clever Cumanian named Sepelt"(6). The same interest in livestock breeding is suggested by the fact that Erzsébet Szilágyi (mother of King Mátyás) carried on personal correspondence with the manager of her sheep-farm at Porládony(7); that King Mátyás took pride in his knowledge of livestock breeding(8); that Tamás Nádasdy paraded before his bride Orsolya Kanizsai with the words: "My heifers are finer than yours"(9); that Prince Pál Esterházy, later Palatine of Hungary, imported Swiss cows in 1680 and organized the first regular Hungarian dairy-farm(10); that Count Károlyi Sándor Kuruts General, when sending home in 1704 a rich booty from Austria wrote a letter to his wife in a disguised way: "Swiss cows are, my Dearest, very useful, bulls of other breed should not get near to them, keep them in the Károlyi-farm, have them milked three times a day; from autumn they have to be housed in a shed and scratched every day; may God give you luck"(11). It was interest in livestock breeding that under the Turkish rule both the Turks and the Hungarians knew better the "origin of their horses than their own"(12); that I. Vedres, an engineer, wrote a real heroic poem on livestock breeding(13); that Count István Széchenyi wrote a book "On horses"(14); that in the Gödöllő estate a precise feeding and milking diary was kept of every cow as early as in 1838(15). The Bonyhád landrace, the milking world record of the cow Dáma, etc. are also indications of the same interest in breeding. Naturally, this interest in breeding was in most cases encouraged by the material and even moral advantages involved. In many respects the stimulating effect of trade also had a part in it. All these examples show that while much can be achieved by orders, financial means and intellectual guidance, the success would not have been full withuot an interest in livestock breeding.

Fashion can more or less be placed in the same category. The importance of fashion in livestock breeding should not and cannot be denied. This change of public taste occurring from time to time and dominating for a while is a very great power. Its presence and effect can be felt everywhere. Fashion is a factor that influences not only the dressing, the behaviour, the taste, but also other human manifestations (e.g. moral).

In Hungary every breeder knows how important a role fashion played in the distribution of the different breeds (Simmenthal, merino, meat-type pig, English pure-blood) to what extent and in what direction it influenced the breeding activity directly (horse-race) and even more so indirectly (combing wool, fat meat, lean meat). Every tendency has followers and opposers – the same holds true for livestock breeding –, and such tendencies often become fashionable.

To illustrate what we have been talking about we mention the most obvious example: the colour formalism. In Simmenthal cattle at first the sandy-coloured, that is the light yellow spotted was regarded as reliably pure-blood. Later the darker colour red-spotted was preferred.

Grey horses generally were not liked; many did not like horses bearing conspicuous marks, while others even preferred such horses. In cold-blooded horses the yellow ones were sought after for several decades, and much higher prices were paid for them than for other coloured but otherwise more valuable horses(16).

It should be remembered that even the world-famed Simmenthal breed began to spread under the influence of colour formalism, and fashion always played some role in its development. In the middle of the 19th century the local, rather heterogeneous breed in the Canton of Bern was mostly selected for colour. Considering that the different colour was accompanied by different other features too, this selection led to the formation of certain groups. Fashion later called attention to the spotted types, and then the uniform colour cattle was discarded. This process was enhanced by the preference the foreign purchasers gave to the spotted cattle, so the Swiss breeders consequently and rather strictly separated the dark pigmented animals. It was in this way that the pigmented black-spotted Freiburg, the darker red-spotted Bern and the lighter red-spotted Simmenthal breeds were born. Of them – fusing with the Bern cattle – the Simmenthal became winner.

Snobism, in a good sense of the word, and social prejudice appearing then in the most diversified forms can also be placed in the category of fashion. At that time, poverty was considered a shame, and those who did not fatten and slaughter pigs were despised, who ploughed with cows treated disrespectfully, while those who kept horses or raised bulls were respected. Snobism was characterized by various "gentlemanly" sports (Ireland horse, polo pony).

Although interest in breeding and fashion only became prevalent when somebody recognized and utilized the financial possibilities in them, still both of them were so strong that their effects were either directly or indirectly felt and had a considerable influence on the trend of livestock breeding in that period.

Research

In the period discussed research played an equally important role in the field of science, technics and production.

On the interaction of science and production *T. Hoffmann* wrote: "science may have a control over all manifestations of social life"(17). This typically applies to livestock breeding in the period concerned.

Research involved in any scientific work was organized at the end of the 19th century.

In the inter-war period research – concerning livestock breeding – was carried out under the guidance of the following state organizations:

Royal Hungarian Experiment Station for Zoobiology and Feeding, Budapest; Royal Hungarian Wool and Silk Qualifying Institute, Budapest; Royal Hungarian Silkworm Egg Research Station, Szekszárd; Royal Hungarian Milk Experiment Station, Magyaróvár; Royal Hungarian Dairy Product Controlling Station, Budapest; Royal Hungarian Veterinary Institute, Budapest; Royal Hungarian Agricultural Research Institute, Beregszász.

Besides the above, succesful research work was carried on at departments of universities, colleges and academies too.

Of the institutions enumerated, the Experimental Station of Zoobiology and Feeding was established in 1896 for analysing feed, studying the composition and best utilization of Hungarian feed types and propagating the knowledge of feeding as widely as possible. Its directors were: *F. Tangl* (1896–1917), *I. Weiser* (1917–1933), *A. Zajtay* (1933–1934), *G. Hatos* (1934–1944). The Royal Hungarian Wool and Silk Qualifying Institute was organized in 1898 by *J. Rodiczky* who became the first director of the Institute.

The Royal Hungarian Milk Experiment Station was established in 1903 with the purpose of raising the dairy management to a scientific level and solving the related theoretical and practical problems *(I. Ujhelyi, O. Gratz, J. Csiszár)*. The Royal Hungarian Dairy Product Controlling Station was organized in 1927 with the aim of raising the Hungarian milk production and improving its quality, as well as of branding the dairy products on the basis of scientific tests. The Royal Hungarian Veterinary Institute – in addition to carrying on extensive research – established diagnoses, controlled vaccines and performed laboratory tests.

The livestock breeding policy of the period was not so much interested in the research work intself as in its results and tried therefore to utilize it in the development of livestock breeding.

In spite of this, technical developments did not produce any considerable result in the capitalist era. One of the causes was the "poverty" of the post-Trianon times when Hungary could not afford larger investments and other additional expenses – particularly at the time of the economic crisis. Another cause: the level of modern technics called to the support of agriculture was much higher than the level of farming, so it could not be properly utilized. That is why most of the new technical achievements were almost forcibly applied to agricultural users.

Other means

In the period in question the livestock breeding policy naturally disposed of a great many other highly efficient means besides the above. Of them it is marketing, profitability, and the economic factors in general that are worth being mentioned.

Although all this is already beyond the scope of livestock breeding—and perhaps even beyond the scope of agriculture—, still it seems to be right to make some comments on the question.

The rapid and smooth marketing of products produced by the livestock branch was one of the most powerful weapons of the livestock breeding policy even at that time. Before the economic crisis when marketing did not encounter difficulties it was of no special importance, and that is why this otherwise highly efficient means was placed in the group "other means". Later when the unbelievably low level of consumption coupled with the economic crisis caused serious difficulties in marketing the necessity of state intervention arose.

In spite of the fact that the bulk of the livestock products was absorbed by internal consumption, the marketing situation of post-Trianon Hungary was determined by the external market, that is by the possibility of export. The production of Hungary having fallen out of the unity of the Austro-Hungarian Monarchy cannot be assessed objectively, because the "production surplus"—that is the volume of commodity to be exported—was the quantity of products not consumed owing to the low living standards rather than the result of excess production. Accordingly, the marketing and export situation was hardly able to characterize the actual conditions of livestock and livestock production.

That was the reason why the livestock breeding policy of Hungary was confined to a mere symptomatic treatment at that time.

Methods of livestock breeding policy

In the period discussed the livestock breeding policy of Hungary was effectuated by the following methods: setting the target of breeding, carrying on selection with a view to achieving the target, herd-book registration, activity of development organizations, sire supply and animal shows (competitions).

Setting the target of breeding was undoubtedly the most important way of control. In spite of this—although this question was constantly in the centre of interest—the target of breeding took shape not so much under the influence of an upper control as from the experiences gained in a wide practice of livestock breeding. This process is sufficiently demonstrated by the development of breeds.

Selection is generally known to be the basis of livestock breeding. At the beginning—in Hungary like everywhere in the world—attention was only paid to the exterior of animals, and attempts were made to draw conclusions from it to other properties, especially as to productivity.

In this way the exterior became the basis of selection. At that time only fine

shapes, attractive colour and large frame were appreciated in animals. Later it was realized that there is no close correlation between outer and inner properties and one of the most important characters, heredity, cannot be concluded from the exterior of animals. So breeders changed over to carrying on selection on the basis of measurable properties, that is: performance.

As every animal has the characteristic feature of producing similar progenies, origin became the central problem of research, and breeders hoped that they would be able to determine the heredity and breeding value of their breeding animals. It was with this in view that the system of registering the ancestors and families developed, called at that time pedigree breeding.

Herd-book registration provided the greatest help in developing livestock breeding in Hungary in the period discussed, although in the inter-war period its effect was not so marked as it is today in the field of progeny control. However, the decisive importance of herd-book registration gradually came to be felt.

The importance of herd-book registration in livestock breeding was undoubtedly fully realized and widely applied at that time. The outstanding merit of the period was the realization of the essentials of herd-book registration, namely, that the mere registration of the data of production, breeding and origin was not enough in itself, as the final aim was to select the breeding pairs in such a way as to obtain a progeny more valuable than the previous generation(18).

The activity of development organizations—irrespective of whether they were state or social organizations—promoted the development of livestock breeding to an almost unbelievable extent.

Livestock breeding policy, the improvement of livestock breeding in the inter-war period was the duty of the minister. The organs of the supreme authority—the state and county apparatus—were naturally supported in this work by social organizations. Such organizations—performing a usually semi-official though highly valuable activity—were found in considerable number ranging from the Horse-Racing Society founded by Count *I. Széchenyi* through various livestock breeding associations to the National Hungarian Economic Association.

The work done by these social organizations of highly diversified character and interest was much more important and efficient than generally thought so far. The cause is to be found is the enthusiasm of their leaders and members whereby they were able to achieve results even when the official means were no more efficient.

The work of the carefully selected milk controlling staff trained on the basis of uniform principles and educated in a healthy spirit cannot be duly appreciated. Their propagating activity was coupled with a successful advisory work. They carried out the control, registration and advised on the composition of feeding. Their good results may be attributed to the fact that their advice generally was accepted and prescriptions were followed. The "secret" of their success was the fixed scope of activity, concern for a single kind of animal as well as the respect and sympathy evoked by their sense of duty, thoughtfulness, unselfishness, modesty, enthusiasm, and outstanding professional knowledge.

In the inter-war period livestock breeding societies and district associations functioned under the guidance of the National Committee on Herd-Book Registration, which in this capacity was a semi-official organ of the Ministry of Agriculture. Its members were elected partly by the Ministry, partly by the livestock breeding organizations. The principal task of the National Committee on Herd-Book Registration was to prescribe the rules of herd-book registration, control the precise and expert keeping of herd-books and ensure its authenticity. The Committee established the rules of judgement and registration and checked their observance. Of the best material of breeding associations a national elite herd-book was kept. Through its commissioned experts the Committee took part in the judgement of herd-books and so was able to ensure uniformity, expertness and reliability in the entire field of herd-book registration.

The greatest merit of the National Committee on Herd-Book Registration was its synthesis of state and social organizations, since the interested breeders as well as experts independent of the ministerial apparatus – e.g. university professors – also took part in the work of both the Committee and its executive organs (associations, societies, etc.). That is why these organizations were generally known at that time as highly "democratic" associations.

One of the most efficient and most successful methods of central guidance in the period discussed was the *sire supply*. Male animals with excellent properties and an ability to transmit them were of special importance mainly because a disproportionately larger number of progeny could be expected from them than from female breeding animals. Namely, a male animal could produce about fifty times as many progeny as a female. The rapid propagation of good characteristics depended thus on the sire supply. For this very reason the attention of state guidance was mainly focussed here. In spite of the difficulties the capitalist livestock breeding policy was very succesful in this regard.

The import of male breeding animals in connection with the above was rather thoroughly treated when discussing the individual breeds.

The *animal shows* (competitions) played a considerable role in the inter-war period and greatly promoted the development of a sound breeding policy.

Prizes for animals, animal shows and various competitions can be placed in this group as well. According to the opinion of *S. Konkoly-Thege* the judgement of the jury had, in general, a directive effect, while awarding increased the competition(19).

In the series of these shows the national animal show became the central festival of Hungarian livestock breeding. Today its importance is already difficult to ascertain properly.

In the inter-war period not only the large, Budapest and county shows were very useful but the smaller, lower standard district and village shows and competitions too. These smaller shows often aroused such an interest in livestock breeding which influenced favourably and sometimes even orientated the livestock breeding of a region.

Here we have to mention the various competitions (milking, etc. competition)

too. On these occasions the participants tried to surpass one another whereby they exposed their animals to an unusual stress.

The importance of these events can be well demonstrated on the example of horse-races. The importance of horse-races from the point of view of livestock breeding policy is not fully appreciated nowadays, although it was the first well-proved method of selection by performance.

It should be mentioned here that the draught-horse competition aimed at testing the capacity of draught-horses was organized with great success in the period discussed (1925)(20). *B. Gaál* who laid down the regulations chose the Tattersaal and Show-Ring in Budapest for holding the competition(21).

Breeding policy in production

The quality of livestock – practically identical with production – is determined by the productivity of animals and by feeding.

The breeding policy by coordinating with its own means and methods the question of breed and feeding in accordance with the state and social requirements, essentially fulfilled, its task.

Livestock production was much more an economic phenomenon determined and influenced by quite different forces.

Production was, naturally, the most important thing in the inter-war period, and no matter how much attention, effort and action were focussed on it, livestock breeding policy at that time was only interested in it inasmuch as to ensure its means, methods, directives, measures, etc. were right. For the breeding policy, production was thus a mere mirror in which it could see itself. From this point of view production was only considered a result.

That is why the study of production – however strange it sounds – has only a secondary role in this context, and only deserves attention insofar as it reflects the efficiency of the breeding policy.

When studying the livestock production of the period discussed we have to answer three questions: what, how much and what quality was produced by the livestock of Hungary.

The *first* question is easy to answer: meat, milk, lard, leather, wool and draught-power. The other products (fur, horn, lanolin, pearl-ash, feather, string, serum, etc.) were negligible compared to the former, therefore they were rightly ignored by the breeding policy. Manure production, on the other hand, – though it never was a breeding object – is worth considering.

The *second* question is much more difficult to answer, because no sufficiently reliable data are available for the inter-war period. The volume of livestock production could only be concluded from the consumption and export – or by estimation on the basis of some rather uncertain data. Any attempt to assess the

draught-power is almost impossible even with such methods. Naturally, all this is only true from the point of view of breeding policy, the economic aspects are quite different.

It is highly characteristic that those engaged in breeding policy as well as the economists and historians(22) – who dealt with the livestock breeding of the period not only very thoroughly but also very efficiently – treat the question of production rather "off-handedly".

To the *third* question – the quality of livestock products – an authentic answer can no more be given; attempts may be made at the most at estimation on the basis of price trends or at certain speculative hypotheses.

In studying the facts of production it seems to be the best way again to deal with the details in the different animal species separately.

In cattle production it is milk, beaf, leather, manure and draught-power that primarily deserve attention.

According to data and estimates on the national milk production, the milking averages were 1000–1500 litres in the twenties and 1800 litres in the thirties. On the basis of the 1930 data – considered rather reliable – the annual per cow milk production may be put at 1830 litres on a national average.

We do not make any great mistake when estimating the national milk production – without calf milk – at 1350 million litres a year.

In a lecture delivered at the 1934 Congress of the National Hungarian Economic Association *O. Wellmann* gave an account of the milk production of the Kapuvár estate where eleven Hungarian red-spotted cows yielded 581·1 kg milk a day, the production of seven of them exceeded 50 and of two 60 kg, with a maximum daily amount of 66·6 kg. In his opinion no foreign country – not even America – could claim similar milking results, which was all the more significant as it was not lowland cattle with low butterfat content milk but Hungarian red-spotted cows that he spoke about(23).

In the milk production of the period in question the all-time record output was encountered on two occasions.

The Hungarian red-spotted cow No. 171 named Dáma of the Kapuvár estate produced 36 times as much milk as its own live weight in a year, when in 1935 it yielded 19 664 kg milk with 3·54 per cent butterfat in 358 days in the Kistölgyfa dairy-farm managed by *A. Borheck*. The highest daily milk production of this cow was 70·1 kg.

The cow No. 26 named Auguszta in the Dreher estate attained a world record in butterfat production, when in the Martonvásár farm it produced 757·5 kg butterfat in 12 707 kg milk a year. Hardly anything can be said about the quality of milk production; it is only on the basis of butterfat percentage that some sort of qualification can be made. Exact analyses of the milk of controlled cows showed 3·7–3·8 per cent butterfat on a national average. As it can be safely supposed that the uncontrolled cows which made up the bulk of the national milk production produced less, and so higher butterfat content milk, the national average butterfat content of milk production may be put at 3·8–3·9 per cent. With hygienic

aspects taken into consideration, the quality of milk production was – naturally – less favourable.

The value of annual *beef* production was exactly half of the value of milk production, 50·63 per cent in 1928–1929 and 43·58 per cent in 1933–1934(24).

The volume of *leather* production depended upon the number of slaughtered or perished animals. Since it could not be influenced by the breeding policy, and its value, i.e. quality – being a function of processing – was mainly of industrial nature, its treatment goes well beyond the limits of the subject.

Manure production is a different question in spite of the fact that the breeding policy does not affect it either, although it is a very important but not fully appreciated branch of livestock production. The annual value of cattle manure was estimated by *Éber* at 104·0 million Pengős(25) in 1928–1929. This calculation based on data of the Hungarian Economic Research Institute did not even indirectly mean anything for the breeding policy, since it did not represent the actual manure production only its supposed monetary value imagined on the basis of theoretical approaches. When comparing the 115 920 thousand q manure production calculated with 80 q per head of 1449 thousand standard animals in 1928 with the "actual" 106 880 thousand q manure produced by 1336 thousand standard animal in 1934, we obtain a negligible difference of 16 kg per ha arable (9040 thousand q on a total 5594 thousand hectare).

According to rough calculations it was only every seven years that 90–100 q/ha farmyard manure could be distributed on the arable area of the country(26). According to *Konkoly*, with the pre-war livestock number and manure production a maximum of 160–180 q/ha could be distributed every four years on a national scale, which was by no means a sufficient amount of manure(27). Thus, the mentioned highly authentic authors only calculated an annual amount of some 20 q/ha farmyard manure.

The measure of manure application varied in the different parts of the country, since manure production depended not only on the number of animals but also on the amount of litter, while manure consumption on the mode of utilization (fuel, etc.). This was known at that time too, as the straw yield was reported by the farm inspectors(28).

In the inter-war period draught power was a very important "product" of the cattle branch. Its size and the changes in its importance can be more or less assessed by the number of draught oxen.

The "power output" of the cattle stock decidedly and markedly decreased in the period examined. The draught oxen were then finally "done for" in spite of the fact that during the economic world crisis in the thirties they represented a self-evident source of power maintained by feed produced on the farm and not requiring cash expenses. The farmers began to return to extensive production and draught power cultivation as they did not dispose of the capital required for intensive production, – reported the Farm Inspectorate(29) of Pest County (1924). According to the report of the Farm Inspectorate of Győr County (1931) owing to the adverse economic conditions, the soil cultivating machines were put out

of service in many farms, because the use of mechanical force did not prove profitable. The farmers who had purchased soil cultivating machines and therefore decreased the number of their draught animals, after putting their machines out of service were unable to replace their draught power for lack of capital(30). Owing to the too expensive fuel compared to the produce of farms, mechanical soil cultivation was almost completely replaced again by the use of animals – reported the Farm Inspectorate of Győr County in 1933(31).

Some rough conclusions on the quality of draught power supplied by oxen can be drawn from the fact that the reduction in the number of grey Hungarian cattle involved a decrease in the value of draught power too.

The production of *sheep farming* was built at that time almost exclusively on wool production. Its value was estimated by *Éber* at 14·2 million Pengős in 1928–1929, and only at 5·0 million Pengős(32) in 1933–1934.

Éber put the value of annual ewe-milk and mutton production at 8·8 and 7·5 million Pengős in 1928–1929, and 3·9 and 4·3 million Pengős in 1933–1934, respectively(33).

The importance of ewe-milk, and so the milking of ewes gradually increased in the thirties. According to our estimates and calculations the milk production of the Hungarian sheep stock was some 1 million litres a year in those days. The production of one milked ewe was around 30 litres. During the economic world crisis the sheep stock of Hungary was reduced by one-third because wool prices fell below the production cost. The catastrophe was only avoided because sheep owners – on the advice of *J. Schandl* – began to milk their merino ewes. Attention turned to ewe-milk and sheep products all over the country, because sheep owners realized that it was milking that made sheep farming profitable.

This was very important, as in Hungarian sheep farms no attempt had been made so far to increase production, and management was accordingly of extensive character; so it was milking that launched intensive management in sheep farms.

The importance of sheep milking was further increased by the fact that the cash money received almost day by day for sheep products meant more than its actual value at a time of a general shortage of money. Namely, a large proportion of day-wages was covered from the money paid for ewe-cheese both in smaller farms and larger estates. All this had the consequence that – at that time of extremely low fodder prices – sheep farmers soon began to give fodder to their milking ewes in order to increase the cash income, whereby not only the milk production but also the income of sheep farms were significantly raised.

When speaking of ewe-milking we have to mention the milking record attained by the pure-blood Frisian ewe No. 161 of the Agricultural College of Magyaróvár which on the occasion of a trial milking produced 7·98 litres of milk a day. This result is considered an unparalelled achievement even today.

The possibilities and importance of fur and hide production in the sheep branch of Hungary were not fully appreciated, although in those days some 2·5 million lambskins were processed in Hungary, that is several times more than the number of lamb progeny.

The production value of the *pig branch* was estimated at 519·1 million Pengős in 1928–1929 and 157·6 million Pengős(34) in 1933–1934.

It is very difficult to answer the question what the ratio of lard to meat was in the production of pig farming. The volumes of exported lard and bacon would present a basis if they characterized the actual production rather than changes in the economic conditions.

The production of *horse breeding* was almost exclusively "power supply". To our judgement neither its quantity nor its quality can be assessed, although there are calculations available in this regard(35).

To sum up what has been said about the production of the individual animal species: the changes showed a favourable trend everywhere. Namely, the fallback in production value was not due to any quantitative or qualitative decrease of products, it was only and exclusively the result of a fall in prices during the economic crisis.

Livestock farming and crop growing

A very important section of state guidance in livestock breeding – i.e. livestock breeding policy – deals with the relations of livestock farming and crop growing. In spite of the fact that crop growing policy is the right forum for this question, these correlations have to be discussed in this place, since livestock breeding has a similar influence on crop growing as crop growing had on livestock rearing.

Thus, it does not seem to be right to neglect investigation of the correlations of livestock farming and crop growing when we speak about state control in livestock breeding.

The correlations of livestock farming and crop growing in the inter-war period have to be examined from three points of view: field growing of fodder crops, draught power, and the manure requirement of agriculture.

When comparing the fodder growing areas in 1923–1930–1938 we find no essential changes, as the regional variations of interchangeable fodder crops compensated each other: the sowing area of lucerne increased while that of clovers decreased; the acreage of maize increased while the joint area of barley and oat decreased, etc.

From the point of view of breeding policy the sowing area is more important than the yield, since the former reflects the intention (planning) while the latter merely the weather conditions. Namely, planning – as called for by demand – characterizes the situation of livestock farming much better than the conditions and results of crop growing do. The sowing areas changed, accordingly, more or less parallel with the standard animal number. These figures do not show, however, any special tendency to a more intensive feeding system.

Draught power is as important a link between livestock farming and crop growing as the field growing of fodder crops just discussed.

It is very difficult to rely on exact figures when studying the breeding policy

aspects of relationship between draught power and crop growing in spite of the large number of valuable data available for the period in question.

The percentage distribution of draught animals(36) according to *A. Kiss* can be seen in Table 99.

	1911	1927	1935	1942	
Horse	69·2	73·0	79·6	75·7	
Ox	25·9	18·9	11·3	16·1	
Draught cow	4·9	8·1	9·1	8·2	**Table 99.**

Thus the ratio of draught oxen first decreased then increased again in the inter-war period and so did the proportion of horses. The number of draught cows, on the other hand, first increased and later decreased under the influence of the critical times.

Much more is said about the situation by the draught animal number expressed in draught horse unit per 100 ha arable, which was 5·9 in 1911, 5·5 in 1927, 5·4 in 1935 and 5·2 in 1942, that is, showed a rather even decline. In *A. Kiss*' opinion the draught power meant a great burden for Hungarian agriculture, as a considerable part of the draught power maintained in the dwarf and small holdings was not fully utilized, and machines only meant draught power saving on large estates in those days(37).

In 1935 the number of draught oxen was relatively higher in Transdanubia than in other parts of the country. Horse-drawn ploughing, mechanical work and conveyance also showed larger proportions in this region of Hungary.

The introduction of machines undoubtedly meant an end to the draught stock but this did not happen as quickly at that time as thought by many. The ox was maintained for its cheapness, the horse for the possibility of conveyance – and for its military use. Authors dealing with this question leave the great importance of carting among the peasants out of consideration.

The costs of ploughing 1 hectare land, according to contemporary calculations(38) are shown in Table 100. Thus, with the exception of deep ploughing it was generally cheaper with horse power. Conveyance in Budapest (horse-drawn: 0·55, mechanical 2·48 pengős) was naturally carried out by motor lorries and not by tractors.

	Draught horse Pengő	Tractor	
Shallow ploughing	6·79	7·82	
Medium deep ploughing	13·63	14·34	
Deep ploughing	25·53	23·98	**Table 100.**

According to contemporary statements(39) many possibilities were not properly exploited in this field. We do not agree with this opinion, because the peasantry – primarily the small holders – worked almost exclusively with draught power.

Mechanical work was – naturally – bound to win sooner or later, since the difficult operations were even then performed at a lower cost by tractors(40).

On the basis of calculations made by *Á. Farkas*, *Konkoly-Thege* was of the opinion that the number of draught animals was sufficiently high in Hungary to ensure at least a medium intensive farming in all farm categories, and in the dwarf and small farms even the possibility of intensive farming could have been provided for(41).

The maintenance of animals for producing *manure* was closely connected with crop growing, that utilized it, at that time too. We spoke about this when discussing the production of livestock and only wish to add – now from the point of view of crop growing – that in the inter-war period manure production in the country only ensured some 15–18 q/ha manure a year, that is, the requirements of intensive cropping were not satisfied. Even if the exactness and reliability of various calculations and estimates concerning the volume of farmyard manure produced are questionable it can be taken for sure that manure production was far from covering requirements(42).

Thus, in the inter-war period the livestock branch while supplying the crop growing with the necessary draught power remained below the required level in manure production. This was the main cause why fodder growing could not fulfil the requirements of livestock farming either.

Investigations into profitability aspects of livestock farming and crop growing reveal that the former generally was in a more favourable position. Moreover, the higher prices of crops realized through livestock farming lessened the deficit of agriculture. The intensive farms lived actually by livestock farming. *J. Blantz* – a prominent agriculturist of the period – wrote: "The cattle stock provides an income even under the present conditions by which the farmer can profit and partly compensate for the losses of crop growing"(43).

So livestock farming helped to prevent the total failure of crop growing in two ways. It made a more favourable realization of unmarketable and valueless crop products possible, and through the more intensive management conditions thus created increased the production, decreasing the production cost; furthermore the higher number of animals produced a larger volume of manure and so indirectly decreased the extent of overall loss.

The difference was, in essentials, that while in pre-war times crop growing yielded the higher income, after the First World War it was the other way round: in the inter-war period livestock farming was relatively more profitable. *Blantz* gave a clever explanation of the situation: ". . . as long as the present conditions exist . . . instead of cereals that are not easy to sell . . . we grow fodder crops and utilize the output of land either by calf raising, or fattening or by milk production"(44).

This change, besides promoting a more intensive management, decreased the depletion of the soil.

When speaking of livestock breeding policy it seems to be right to point out the disadvantages of *Nagyatádi Szabó*'s land reform(45). Namely, those given land

during the land reform mostly did not possess animals, and even if they did were compelled to sell them owing to the adverse conditions of land grant. Consequently, with pig and poultry raised for household consumption not taken into account – livestock farming was deprived of more than half a million hectares of agricultural area by the land reform(46).

Contemporary forms of livestock farming and breeding in Hungary

The earlier forms of livestock farming and livestock breeding – the former strengthening, the latter declining – were still more or less recognizable in the inter-war period.

Two major forms of livestock farming are usually spoken of as having existed in the period discussed: the manorial (large-scale), and the peasant (small-scale) system of livestock breeding.

This distinction is not right as the categories are determined on the basis of farm size. Classification can better be carried out by the intensity of farming. For Hungary in that period this grouping can be simplified by separating the farms carrying on an intensive livestock breeding from those with extensive livestock farming.

When looking at it from this viewpoint we have to establish that the intensive and extensive peasant, and the corresponding manorial livestock breeding were much more like each other than the livestock breeding in large-scale and small-scale farms. The typical forms of intensive livestock farming were, namely, rather similar. Intensive livestock breeding on the 130 thousand hectare entailed estate of the Princes Esterházy was hardly different – either in its methods and tendencies or perhaps even in its means – from the livestock breeding system of peasants in counties Sopron, Tolna and Baranya farming on a higher level. On the other hand, there were large estates where the animals to be found in the stables of farm servants were finer than those of the landlord.

Livestock breeding in Hungary in that period was characterized by the earlier discussed forms of *livestock farming* shifting under intensive conditions of management toward *livestock breeding*, while under extensive conditions remaining unchanged. This was the case both in manorial estates (large-scale farms) and peasant holdings (small-scale farms).

When following the advances in the so-called *peasant livestock husbandry* we can make a sharp distinction between pasturing – a moving system of livestock husbandry characteristic of earlier centuries, based mainly on grazing, – and the mostly self-supporting livestock husbandry of small peasants and commodity producing livestock husbandry of wealthier peasants both stationary, integral parts of agriculture and more or less supported by fodder growing. The latter finally became a typical form of livestock breeding and farming in the 20th century. No matter whether it was small peasant or rich peasant husbandry, both were characterized by the landowner being at the same time the owner of animals. So their livestock husbandry did not grow out of the frames of farming

but forming an integral part of it and in interdependence with crop growing primarily served the interests of the farm.

As a type of peasant livestock husbandry poor peasants, and the agricultural proletariate maintained animals in the farm-yard, independent of cropping, mainly for household consumption, and apart from the common pasture and common shepherd had no relation with the community. This type of livestock farming was carried on in the small settlements before the Hungarian conquest as well as in the inter-war period. The same group includes the often very considerable livestock maintenance of manorial employees – mainly of those paid in kind – too. This type of livestock maintenance was sometimes a perfectly organized, well-established permanent system of animal husbandry regulated by customary law, while in other cases an unorganized, occasional form relying on loose connections.

In a typically capitalist form of peasant farming young oxen were for a couple of years moderately used for draught work, then fed up and sold on the market, and for a part of the selling price the owner bought the same number of, but smaller, lighter and mainly much cheaper young oxen; or young oxen were raised for sale to estates bringing their bullcalves to the slaughterhouse, partly to replace draught oxen, partly for the purpose of fattening. Sometimes young heifers first in calf were raised for sale to manorial dairy farms, or high milking capacity cows for milking dairies. Here belong, further, the most diversified forms of share management, share fattening, share calf rearing, etc. No matter what the form this system of livestock raising and breeding appeared in, was like, it was typically a business undertaking based on exploitation of the given farming conditions.

Of these livestock raising forms in peasant farms those in which the owner of animals wished to attain an additional income beyond the maintenance of his farm (draught power, manure) and household (food) through livestock breeding (bull raising) became more and more dominant in the inter-war period. This process proved very useful because it resulted in an increasing number of peasant farms carrying on intensive farming.

We have to mention separately a recent form of individual animal rearing which – as distinct both from farming and any form of association – cannot be placed among the above systems; it served exclusively the sustenance of – mostly wage-earner – peasants having fallen out of the peasant community, in many cases living at some distance from the village, but perhaps even more often of village people engaged in other than peasant work. Such were the artisans, railwaymen clerks, tradesmen, pensioners whose livestock rearing was mostly confined to pig fattening.

Last but not least, special attention is to be paid to the stationary, crop growing dependent *manorial livestock husbandry* both in its earlier allodial form and the subsequent system of manorial livestock raising and later livestock breeding, since they were the rudiments of the present large-scale system of livestock breeding. Socialist livestock husbandry also has its roots in them. The development of this form was, in essentials, unbroken, and was not even deeply affected by such

changes as the abolition of serfdom; different rate fluctuations, or perhaps deviations at the most, but no change in its frames or character can be spoken of. This form of livestock husbandry is characterized by a fairly even evolution from the allodium to the co-operative farm.

In spite of the considerable number of backward, low productivity estates deficient in funds, the great and not sufficiently acknowledged importance of these well functioning farms lay in their activity of high professional level keeping abreast with the development of natural sciences, in their uniform management, application of new achievements, their means and methods, in their instructive and propagative influence and above all in the impact created by their example.

Thorough investigations into the history of agriculture throw light upon the qualitative superiority of large-scale farms over small-scale farms. It was namely in this category that the possibilities of intensive livestock breeding were given even in the inter-war period. The small-scale farm only followed the example, but never initiated anything. The key of its success was the peasant's unparalleled zeal – originating from his interest –, the pertinacious efforts and sometimes superhuman performance of his whole family, his care for his animals and produces and his continuous indefatigable work.

Finally, we must not forget to speak of the industrial nature of livestock husbandry, as a form distinct from the farming systems enumerated so far, or shifting from them toward industry.

To be mentioned here are in the field of cattle husbandry the highly important so-called milking dairies, in pig husbandry the industrial fattening plants and in poultry rearing certain farms.

These livestock raising forms were not primarily characteristic of the Hungarian conditions in the inter-war period, therefore they are only mentioned here in passing.

Cattle-farms in this period not engaged in calving or calf rearing – i.e. in any kind of breeding – but organized and maintained exclusively for milk production were called milking dairies. They were established at that time mainly in the neighbourhood of larger towns. In the milking dairies the cows purchased at an advanced stage of pregnancy were calved, the calves immediately sold, and the cows were not mated again but milked until their output decreased to 5–10 litres, meanwhile their condition improved. The cows, when no longer able to return the expenses by milk production and weight increase, were slaughtered. From the point of view of breeding policy this form of management did not meet the requirements because – while increasing the volume of milk production and by purchasing highly productive milking cows at favourable prices, encouraging the breeding activity of small farmers – it resulted in slaughtering many valuable highly productive breeding animals.

The similarly industrial nature of cattle fattening should be mentioned here too, which was carried on mainly in the cattle farms of sugar factories and distilleries, but since it was an agricultural rather than industrial undertaking its treatment in this place does not seem justified.

The industrial pig fattening farms and various poultry farms roughly corresponded to the patterns developed in other places too. From the point of view of breeding policy they were of no special importance, and either merged into the general livestock raising pattern of farms, or remained occasional business undertakings.

Notes

(1) Livestock breeding policy is, in fact, a science based on agricultural history, economics, agrarian policy, and to a lesser degree on the relations of production force, utilization and planning. L. Gaál: 1970: 3.

(2) Livestock breeding policy is thus a human activity aimed at improving the livestock —and thereby the production— by co-ordinating the interests of government and livestock farmers (breeders) and taking the aspects of consumption and marketing into consideration. Accordingly, the principles, knowledge, means, methods, organizations, etc. required for attaining the aim all fall within its sphere of concepts. Its essential feature is the rational organization built on well-established knowledge, and joint work co-ordinated with common interests.

The livestock breeding policy classifies primarily the knowledge of livestock breeding, feeding, crop growing, agricultural mechanics, architecture, chemistry, farm management, and the complementary sciences (economics, statistics, agrarian history, legal practice, trade, industry, finance, customs, nutrition, price policy, veterinary hygiene, agricultural administration, social policy, etc.) according to identical viewpoints. Then the data thus systematized are analysed and evaluated, correlations established and conclusions drawn. For a higher level judgement the basic concepts are reinterpreted. The livestock breeding principles of the period and their correctness are supervised. The animal is considered in its natural and economic correlations, as placed under the current social conditions, and the peculiarities of its position are analysed. Livestock rearing and livestock breeding are examined in the process of development and treated in their correlations. The livestock breeding policy recalls the past and picks out the useful experiences of the history of agriculture which can be utilized in the future too, for agricultural history is the true basis and greatest help to every kind of production policy.

The livestock breeding policy provides information on and analysis of the existing conditions, institutions, organizations, legal rules and regulations in effect; assesses the possibilities, evaluates and judges; points out negligence, incorrect principles, misinterpreted facts, deadlocks, missed possibilities, unexploited advantages. Through new ideas raised, new correlations established, and proposals made it promotes the more rational and therefore more useful work. It encourages and maintains an interest in breeding. It applies the results of science to practice and co-ordinates the findings of research with the possibilities of practice. It points out the awkwardness of strict conservatism as well as the failures of an improper or inconsiderate application of progressive techniques. It plans and realizes the optimum utilization and marketing of products. In short: the livestock breeding policy gives every opportunity and means for the purposeful rational improvement of livestock breeding. L. Gaál 1970: 3–5.

(3) L. Gaál: op. cit. 12 (1966).

(4) S. Konkoly-Thege: op. cit. 8.

(5) S. Konkoly-Thege: Állattenyésztésünk fejlődésének fő feltétele (The main development condition of livestock farming in Hungary). 18.

(6) K. Szabó: Béla Király névtelen jegyzőjének könyve a magyarok tetteiről (Book of the anonymous notary of King Béla on the deeds of Hungarians). Pest, 1860: 60.

(7) L. Elekes: Hunyadi. Budapest, 1960: 306–307.

(8) T. Kardos: Hunyadi hadserege (The army of Hunyadi). Budapest, 1950: 151.
(9) G. Komoróczy: op. cit. 83.
(10) Magyar Gazdaságtörténeti Szemle, 1903: 284–285.
(11) G. Hildenstab: Közgazdasági viszonyaink II. Rákóczi Ferenc korában (The economic conditions of Hungary in the days of Ferenc Rákóczi II). Székelyudvarhely, 1910: 80.
(12) F. Kisszántói Pethe: Pallérozott mezei gazdaság (Improved methods of cultivation). III. Vienna, 1814: 462.
(13) Magyar Gazdaságtörténelmi Szemle, 1900: 60.
(14) Count I. Széchenyi: Lovakrul (On horses). Pest, 1828. Trattner.
(15) J. Paget: Hungary and Transylvania . . . I–II. London, 1839: 251.
(16) S. Konkoly-Thege: op. cit. 234.
(17) T. Hoffmann: Agrártörténet (Agricultural history). 1968: 19.
(18) L. Gaál: Törzskönyvezési útmutató (Guide book on herd-book registration). IV. Budapest, 1955: 4.
(19) S. Konkoly-Thege: op. cit. 119.
(20) Köztelek, 1925: 497.
(21) Állattenyésztők Lapja, 1925: 156–158.
(22) S. Konkoly-Thege, E. Éber, P. Gunst.
(23) Köztelek, 1934: 354.
(24) E. Éber: op. cit. 407–418.
(25) Idem.
(26) P. Gunst: op. cit. 308.
(27) S. Konkoly-Thege: op. cit. 217.
(28) National Archives: K 184–10: 8718.
(29) National Archives: K 184–10: 35572.
(30) National Archives: K 184–10: 38622.
(31) National Archives: K 184–10: 25570.
(32) E. Éber: op. cit. 407–408.
(33) Állattenyésztők Lapja, 1932: 35–36.
(34) E. Éber: loc. cit.
(35) Á. Farkas: A magyarországi állati energia gazdálkodás (Management of animal power energy in Hungary). Budapest, 1943.
(36) A. Kiss: Állattenyésztésünk belterjességének alakulása az elmúlt száz évben (1857–1957) (Intensification of livestock breeding in Hungary in the last hundred years [1857–1957]). Budapest, 1958: 24.
(37) Ibid. 25.
(38) Állattenyésztők Lapja, 1932: 148.
(39) Mainly according to the opinion of Á. Farkas.
(40) Köztelek, 1932: 400–401.
(41) S. Konkoly-Thege: op. cit. 215.
(42) Ibid. 247.
(43) Köztelek, 1931: 213–214.
(44) Köztelek, 1931: 180–181.
(45) Act XXXVI./1920, the so-called land reform, is linked up with the name of I. Nagyatádi Szabó, Minister of Agriculture at that time.
(46) Some details of the Reports of the County Farm Inspectorate:

The Farm Inspectorate of Békés County reported (1924) that those given land by the land reform "plough" with spades in many places. Tolna County reported (1924) that those granted land "practically became the cotters of small holders possessing draught power"; Bácsbodrog County reported (1928) that "most of those granted land cannot maintain animals".

According to the Report of Pest County (1937) "it is a great fault, too, that on a considerable part of the land granted, peasants do not maintain either draught or useful animals . . . (National Archives: K 184–10: 8718 and 114119).

Part V

Chapter 20

Animal husbandry in Hungary during the Second World War

The slowly recovering economic life in the second half of the thirties was replaced in 1938–39 by the "boom" of the Second World War. The first two years of the European war radically changed the situation of livestock breeding in Hungary too, since after the marketing difficulties of the twenties and thirties it was suddenly provided with almost boundless possibilities.

The first phase of the war until 1941, when Hungary joined the war, then 1942 and 1943, the years of actual war in Hungary, showed a rapid growth in the whole economic life. In that period Hungary only felt the economic advantages of war. The increased industrial production and the conscriptions meant employment for a wide strata. It was of special importance for the agricultural population, since people who only were employed part of the year – if at all – were now given an opportunity to work. This resulted in a somewhat higher living standard of the families. Otherwise this phenomenon was shown in an increased demand for livestock products as well.

The decisive factor was, naturally, not the expansion of the internal market, but the increased strength of the army, and above all the ever growing demand of Germany among others for products of Hungarian livestock farming. As a compensation for the promise of a territorial increase the successive Hungarian governments were obliged to satisfy the demands of fascist Germany by increasing exports of livestock products too. (In this regard they got to the point that in the second half of the war rations were 15–20 per cent lower in Hungary than in Germany.) No doubt, however, that for the great number of poor people even this ration meant an improvement in consumption level compared to pre-war conditions when protein-rich meats and dairy products had a much smaller share in the nutrition of these strata. (To some extent the same can be said about those serving in the army, namely many of them had previously been agricultural labourers, odd-hands or farm servants.)

The first years of the war thus created highly favourable conditions for livestock farming. This tendency was strengthened by the inflation that unavoidably followed the war. Permanent inflation had been seen to result in considerable investments in livestock farming even during the First World War. In the course of the Second World War no similar rate investment occurred, but the number of livestock significantly grew, the increased possibility of capital investment among producers appeared in the form of a growing livestock. The total number of the livestock not only reached then the level of the period before the First World War but – for the first time since 1911 – exceeded it.

This was promoted by two factors. The excellent fodder yields of 1936–1938 were followed by higher than average fodder yields in 1939–40 too, and after 1941 the fodder surpluses of the reannexed Bácska made up for the losses caused by poorer crops. The improvement of feeding possibilities increased, in turn, the size of the livestock and strengthened the tendencies acting in that direction.

The other factor, prohibition on slaughter, was introduced in 1941 and concerned cattle up to the age of four years. True, the government – seeing the fast rate increase in the livestock – in October 1942 restricted the prohibition on slaughter to cattle younger than two, then between July 1943 and February 1944 even permitted the slaughter of calves below two, but in certain periods of the war the prohibition on slaughter still made its effect on the growth of the livestock felt.

Special demands were raised on certain branches of the livestock. The army urged an increase in the horse stock. The rapid growth of the poultry stock was due to the fact that owing to difficulties arising in the food supply, it was not only in villages that the poultry stock was increased, but poultry raising was also introduced in garden-suburbs and yards of proletarian tenement houses. The number of poultry grew at a fast rate in these places too, in spite of difficulties in feeding. The growth of the stock of oxen can be attributed to the increased role of oxen – and even of cows – in ploughing, since horses were used by the army, and the use of tractors was limited by petrol shortage. The number of oxen grew even in 1943 when owing to difficulties arising in feeding the total cattle stock was reduced to some extent.

During the Second World War the area of the country changed several times. The partitioning of Czechoslovakia, the first Vienna decision, then the occupation of Sub-Carpathia, the second Vienna decision which annexed a part of Transylvania to Hungary, and finally the occupation of Bácska (southern part of the region between the Danube and Tisza rivers in Yugoslavia) – all increased the territory of Hungary, the population number and the size of the livestock. We cannot thus safely rely on statistical data concerning those years, because we would not obtain a true picture of the situation. Therefore, we have chosen the method of only using data concerning the present territory of the country; this is the only way of comparing our data with those on years preceding 1939. Accordingly,

Animal species	1938*	1942**	1944***
Cattle	1881·6	2364·8	2187·2
Horse	813·9	900·4	860·0
Pig	3110·0	4670·0	4099·3
Sheep	1628·7	1708·4	1319·2
Standard animal***	3480·0	4370·0	3998·9

Table 101. Changes in the livestock from 1938 to 1944 (1000 head)

* On the basis of spring registrations of useful animals.

** On the basis of the national animal census in 1942. The survey was made two months later than the usual time of spring registration, some deviations in the numbers can thus be attributed to this.

*** Calculated with the same key as earlier (we did not, however, consider the fact that the proportion of young animals to the total stock grew).

in Table 101 which summarizes the data concerning the development of the livestock, only the present area of the country is taken into consideration; data on the territories reannexed during the war are excluded.

To sum up briefly about livestock farming during the war years it is enough to say that *cattle farming* made the greatest numerical progress between 1938 and 1939, when the cattle stock grew by 10 per cent a year. This naturally reflects the effect of the high fodder yields too. This increasing tendency was promoted from 1941 by a rapid rise in prices, then by the introduction of the mentioned prohibition on slaughter. In response to all this, the number of the livestock culminated in 1942 when a farm census was carried out. The number of the livestock – more than 2·36 million – exceeded not only the number in the inter-war period but also that in 1911, which was unprecedented between 1911 and 1942.

Attention should, however, be called to the fact that the value of the livestock did not increase to the same extent at all. Owing to the fodder shortage which was regular from 1941 and even worsened by the poor quality of industrial feeds the output of the livestock decreased. The meat production per standard animal was about 10 per cent lower than earlier. The milk production was likewise reduced – by about 10 per cent. The proportion of young animals to total livestock increased; their numbers grew by 48·3 per cent while that of cows only by 5·2 per cent compared to the 1938 level. The ratio of cows was only 43·1 per cent in 1942. The number of draught oxen increased by 33·6 per cent. The use of cows for draught work became more general; while in 1935 only 17 per cent, in 1944 already 22 per cent of them were used as draught animal. The character of breed, nevertheless, improved in the livestock, in 1942 the ratio of spotted cattle was already 83·1 per cent. The biological value of the livestock showed a relative improvement inasmuch as in the course of obligatory deliveries the culls were first given over to the state.

The 1942 number could not, however, be maintained for a long time even under favourable conditions. By 1944 it fell back, even to the pre-war level. However, owing to a permanent shortage of feed this livestock produced less and less; by the end of the war, the livestock sector of Hungary was unable to attain the production results of pre-war times.

The omens of war were first felt with respect to the horses. From the middle of the thirties important steps were taken at the request of the army to prevent a decrease in the horse stock and neglect in breeding. In consequence of this the horse number did not decrease in the first years of war in spite of an increased military use, on the contrary, it showed a temporary growth. Although the record number of 1942 could not be maintained, the size of the horse stock exceeded the 1938 level even in 1944. Substantial changes occurred, however, in the structure of the horse stock; similarly to the cattle-stock, the percentage proportion of young animals became much higher.

The situation in the pig branch was not the same as in other livestock branches. Due to successive years of high maize yields at the end of the thirties in 1939 the pig stock exceeded by far the 1938 number. This was followed by a fallback till

1941, then in 1942 the number of pigs grew again. In 1943 prices showed a favourable trend for pig breeding, consequently in 1944 the pig stock consisted of more than 4 million animals on the present area of Hungary, that is it attained the peak of the period.

The development of sheep farming launched in the middle of the thirties by various price supporting and other measures continued in the first years of the war, too, as proved by the increasing number of sheep which in 1942 was the highest since 1925. Nevertheless, even then it did not attain the 1925 level, and the decrease in sheep number after 1942 as a result of which it fell to about 1·3 million by 1944 suggests that the measures taken to promote sheep breeding were insufficient. In the long run a further reduction of the sheep-stock could be expected.

The decline of sheep farming was naturally caused by the low wool prices which did not sufficiently rise even during the war. So sheep farms were compelled even then to increase their profitability by milking (in 1942, 47 per cent of the ewes were milked) and in other ways.

There is nothing to add to what has already been said about the situation of *poultry farming*. No statistical survey of the poultry stock was made during the war. Of the other kinds of animal it is only about *goat* rearing that we should mention that the number of goats became almost twice as high during the war years as it had been earlier. The cause of this can be found in the shortage of milk which in certain—mainly poor—families was partly compensated by goat maintenance.

The first years of the Second World War—until the war front reached the borders of the country—had a favourable effect on Hungarian livestock farming. Nevertheless, the permanent shortage of feed resulted in decreased outputs, the percentage proportion of young animals considerably increased, in short, after a couple of war years the symptoms of an overuse were apparent in the livestock. However, the situation was only made catastrophic by destructions caused by the war front passing over the country. Beyond the damages done to the livestock by the fights, the systematic destructions by German troops must also be taken into account. A considerable part of the livestock, primarily the animals of large estates, were transported to Germany. A part of the animals was, though, returned after the war, but it was only a fraction of those carried off.

Chapter 21

Animal husbandry in Hungary between 1945 and 1970

The Second World War was a turning point in the history of Hungary, the war and its consequences created a new life in the country. Both the social and economic structure and the political life radically changed in a few years. All this brought about a new situation in livestock breeding too.

The destructions of war were enormous. The economy of Hungary was in ruins. The war damages were considerable in agriculture as well, and mainly in the livestock branch since animals were easy to move. The defeated German army systematically evacuated the country and that was the lot of the livestock too. The animals of large estates and state owned land properties were carried off firstly because the livestock owned by the peasantry was scattered so much that its transportation met with technical difficulties. So the peasant livestock suffered less from the front passing through than from the systematic evacuation.

The survey made of the livestock after the war revealed that about 52 per cent of the cattle, 58 per cent of the horses, 74 per cent of the pigs and 76 per cent of the sheep were lost. (In standard animal the loss was 58 per cent of the total livestock.) The losses were not, naturally, uniform in the country; there were regions where hardly any war damage was done, while in certain counties 80–90 per cent of the livestock was destroyed. The livestock of large-scale farms was destroyed, however, everywhere, which meant that the livestock suffered a qualitative damage exceeding by far the numerical losses and checking for a long time any further development in livestock breeding.

The first step of the democratic reorganization transforming the society and economy alike was the land reform in 1945 which liquidated the large estates and gave over the land to the working peasantry, primarily to its poorer strata, the former farm servants, odd-hands and agricultural labourers. The land reform was of extreme importance not only because it transformed the society of the country, provided a possibility for industrial development (by widening the internal market), and – above all – enabled the agricultural production to start immediately after the war, but also because it created new farm conditions for livestock breeding. The large estates ceased to exist and with them their commodity producing, qualitative livestock breeding. This had, naturally, the consequence that the qualitative level of Hungarian livestock farming fell far below the pre-war level for a whole historical period. The new small peasant farms brought about in the course of the land reform ensured, though, the growth of the livestock, since these farms were in need of animals (at the beginning mainly of draught animals), but neither

the qualitative losses could be made up for, nor the volume of commodity ensured earlier by large estates produced for a long time.

Livestock farming had at the same time a key position from the point of view of restoring the whole agricultural production. Namely, the increase of yields in crop growing depended almost exclusively on two factors: draught power and fertilization. And since in post-war years neither tractors nor fertilizers were produced in Hungary, the rapid growth of livestock played an extremely important role in the rehabilitation of the whole agriculture. That was the reason why the numerical increase in the livestock was a central problem of the livestock breeding policy, even at the expense of quality (prohibition on slaughtering was maintained, illegal mating tolerated, etc.).

The decrease of the qualitative level of livestock farming was caused not only by the loss of high quality breeding animals (the loss in this field exceeded by far the extent of losses in the total livestock), and the insufficient rate of replacement, but also by the chronic fodder shortage of successive years, which in the post-war years could not be eased by fodder imports. The development of livestock farming was also hindered by the new delivery system introduced soon after the end of the war, which had in certain respects a more unfavourable effect than the delivery obligation of war years. In the first years following the war it was indispensable for the food supply of the town population, but its maintenance up to 1957 checked the development of agriculture, and particularly of livestock breeding.

The advancement of livestock farming was promoted by the new price system established during the stabilization following the inflation in 1945–46; it resulted, though, in a considerable agricultural price gap (with the price ratios of 1938 taken into account), but within it the agricultural price structure was favourable for livestock products. Still, it was not primarily due to this, but to the industrious work of the peasantry, and above all of the land-granted small farmers that by 1948–49 the livestock attained, and in 1950 exceeded the 1938 number(1). In spite of the fact that outputs were still much below the pre-war level (the milk yield in certain state farms e.g. was only a daily 2·8–4 litres in 1947, and could not be much higher on a national scale either), and meat production did not reach the pre-war level either(2), the abolition of the rationing system suggested that the recovery of livestock breeding made a considerable progress. In 1950 the livestock number exceeded, and the consumption of the population attained the pre-war level, with the difference that the poorer strata, and especially the former agricultural proletariate consumed now relatively more than those whose consumption before the war was higher than average. The milk, meat and egg consumption generally increased in the former poor peasant strata, and decreased in the urban population. As seen from Table 102 in 1950 the size of the livestock generally exceeded the pre-war level even if the number of horses (owing to an increased utilization of machines) and of sheep was somewhat below it. However, the consequences of a change in the economic policy set back the development of livestock breeding for many years. From 1949 a stepped up socialist reorganization of agriculture and the establishment of co-operatives started.

Table 102. Changes in the livestock (1000 animals) from 1938 to 1970(3)

Year	Cattle		Pig	Horse	Sheep	Poultry	Standard animal*
	total	cow					
1938	1 875	915	5 224	814	1 629	17·6	2 933
1945	1 070	586	1 114	329	328	8·0	1 302
1948	1 299	1 042	2 771	651	579	16·3	2 538
1950	2 223	1 064	5 542	712	1 049	18·5	3 128
1952	2 091	874	4 740	698	1 481	18·8	2 953
1956	2 169	891	6 055	727	1 928	22·8	3 236
1958	1 937	895	5 338	724	2 050	24·9	2 983
1964	1 883	767	6 358	323	3 305	29·3	2 843
1967	2 014	763	6 005	287	3 274	32·2	2 887
1968	2 096	779	6 609	274	3 311	31·1	3 010
1970	1 933	738	5 970	231	3 024	33·5	2 762

* 1 cattle = 0·8, 1 horse = 0·8, 1 pig = 0·114, 1 sheep = 0·0714, 1 poultry = 0·004 standard animal

The too rapid rate of agricultural reorganization had an unfavourable effect on livestock breeding which has not totally recovered from it to the present day. Worst of all, production became unreliable. True, the wrong agricultural policy of 1950–52 was followed in 1953–56 by a less drastic, more considerate co-operative policy, but due to a continued aggressive collectivization in 1955–56 the sense of safe production conditions could not be restored in the peasantry. Peasants joining the co-operatives retained their good quality animals in the homeplots and sold the less valuable ones, or gave them over to the co-operative, and slaughtered a part of the livestock. Production in the newly organized co-operatives was extremely primitive, and in livestock breeding did not even reach the earlier small-farm level. The number of animals decreased, therefore, at a fast rate after 1950. After 1956, then with the abolition of obligatory deliveries in 1957 the interest of the peasantry in production revived, though only for a short time, until the final phase of the socialist reorganization of agriculture in 1959–61. Peasants working in the new large-scale co-operative farms first tried to loosen the labour discipline and showed indifference to collective farming, and it took several years until they felt interested again in the production activity of the co-operative farms, and so in livestock breeding too. True, homeplot farming meant in the first place livestock maintaining (mainly pigs, and cows in the second place), but in the co-operative farms which generally did not have buildings suitable for carrying on livestock farming at an appropriate level, the livestock number and production per unit area decreased so much that the production of animals maintained in the homeplots was not able to make up for the losses. At the same time the consumption of the population increased, especially the meat consumption that by 1970 grew more than twice as high as it had been before the Second World War. The tensions thus produced could only be eased for a short time, so from the second half of the sixties on the government elaborated an agricultural policy patronizing

agriculture in general, and livestock breeding in particular. The effect of this policy has not, however, been felt yet in every respect.

But the social transformation was not exclusively responsible for this. After 1949 industrialization was generally carried out at the expense of agriculture – and, of course, livestock farming in it. By the compulsory deliveries and price mechanism agriculture was skimmed off to a considerable extent, which meant that livestock farming was generally a losing enterprise for the producers. Consequently, the producing farms trying to get rid of the deficit reduced the production of the livestock branch as much as possible. This was the main cause of the two decades' stagnation in livestock farming both in numbers and in productivity.

This cannot, however, be regarded as the only cause. Other shocks involved by the transformation also hindered the development of livestock farming. As mentioned before, large farms were liquidated in 1945, and large-scale livestock breeding was replaced – with an exclusive character – by small-scale management. After 1949, small-scale management ought to have been replaced by large-scale production, with the same exclusive character, for which the necessary material and technical conditions (capital, building capacity, machines) would not have been available even if a price system that creamed off the agricultural production had not been introduced. For many years (especially between 1950 and 1956, but even after 1961) co-operative livestock farming did not even reach the level of small-peasant livestock farming. This was indicated also by the rapid deterioration of veterinary conditions, repeated epidemics of foot-and-mouth disease, and the increasing number of death cases due to various diseases caused by inadequate management conditions. The government tried to improve the situation of livestock breeding by various economic policy measures, but since they did not approach the basic problem: the feasibility of production, the expected results were not attained.

The situation began to change in the middle of the sixties, and substantial results were attained after introduction of the new system of economic management (1 January 1968). By that time, however, the structure of the livestock was essentially modified compared to post-war conditions; these modifications have to be looked at more closely.

On the basis of numerical data it is obvious that the development of the livestock was not satisfactory either in absolute number or in breed composition. The stagnation and occasional fallback of the cattle stock, and within it the gradual decrease of the number of cows between 1950 and 1970 made the situation particularly serious. Owing to the continuous deficit of milk production the cattle branch switched over to beef production; this – and even more so live cattle export – was profitable. The per cow milk production (ranging between 2000 and 2400 litres a year) practically stagnated too, yields approached but slowly the pre-war level, and generally did not reach the level of large farms. The maintenance of prohibition on slaughter, the forced management of co-operative farms, then unfavourable forms of the state support system with keeping the culls in life even

increased this tendency. Thus the progress of cattle farming stopped except perhaps beef production, but even this did not keep abreast with the international rate. Another factor involved in the relatively rapid decrease of the number of cows was that the cow stock of homeplots (generally consisting of higher quality animals) declined with the ageing of the co-operative peasantry, meanwhile large-scale cattle farming in the co-operative farms did not sufficiently develop.

A similarly fast rate of decrease took place in the horse stock, caused partly by the increased utilization of machines in agricultural production after 1945, but mainly by the too quick and too extensive sorting out of horses with the establishment of co-operative farms. The horse stock left was otherwise adapted to the new situation and requirements already in the second half of the sixties. However, the subsequent increase in the rate of mechanization soon rendered the importance of the horse in production negligible.

The other livestock branches developed somewhat more evenly. Sheep farming suffered an enormous loss during the war, since the larger sheep-farms were mostly in the hands of large estate owners and so were carried away during the evacuation. In 1956 the sheep stock still exceeded the pre-war level and its subsequent growth was also rather uniform until it reached about 3 million in number. Poultry farming made a slightly slower but similarly even progress. The first thing to be taken into consideration here was that until the middle of the sixties an overwhelming part of the poultry stock was found in the homeplots of co-operative members, and farming was, in general, not of large-scale character. The increased poultry stock (which was but occasionally coupled with an increased egg production) enabled the population to consume more poultry meat and eggs, and was, at the same time, an important source of life for the co-operative peasantry. It was around the middle of the sixties that modern poultry farming systems – broiler production, large-scale egg production, then broiler duck fattening, etc. – appeared in Hungary – first in state farms, then later in large-scale co-operative farms too. As for the entire field of poultry breeding, their effect was, however, only felt after 1967(4).

Improvements in the situation of pig farming were of great importance. Until 1956, then between 1964 and 1967 pig breeding was connected with the homeplots, but in the second half of the sixties co-operative farms took also their share of it. It was made possible – among others – by the fact that large-scale accommodations were cheaper to provide in pig breeding compared to cattle breeding. The economic policy was primarily concerned with it, too, as it played a highly important role in the meat supply of the population. The qualitative composition of the pig stock (ratio of meat-type pigs) as well as the yields improved. In consequence of all this the role and importance of pig breeding increased within the livestock sector.

Around 1967 Hungarian livestock farming was thus characterized by developments in pig and poultry farming which compensated to some extent for the fallback in cattle breeding. This composition of the livestock has not, in fact, changed to the present day, nor have the problems arising from this, still we have

to speak of a new phase after introduction of the new system of economic management on the 1st January 1968.

Fundamental changes occurred in the economic policy of the government, which ensured a gradually increasing production independence for co-operatives, stopped interfering with problems of production and cancelled all enforcement measures taken earlier to regulate production in the co-operatives. Parallel to the above and in close connection with them a new price policy was introduced. After 1949 purchase prices practically remained unchanged for a long time, and the occasional rises did not ensure the feasibility of production. The government had tried to direct the peasantry to large-scale farming by this means – since co-operatives were in a somewhat better position in this regard. When large-scale farming was realized all over the country this price structure hit hard the co-operatives. Then the state subsidized the large-scale farms by raising the purchase prices, but before 1968 mainly by granting tax allowances and investment credits (which later were mostly remitted). In the new situation, however, when co-operative production became perfectly independent, this supporting system was no longer satisfactory. Therefore, from 1968 (for certain produce, mainly cereals, several years earlier) a new policy was introduced which instead of indirect forms of state support ensured the profitability of production by raising the purchase prices, primarily for wool, live lamb, poultry and eggs, feather and pigs. However, the situation of cattle farming continued to deteriorate, cattle production remained a permanently losing bargain. In consequence of this it shifted even more toward beef production, and milk production decreased so much that in 1971–72 a considerable volume of butter import became necessary in Hungary. The raising of purchase prices as of 1st January 1973 brought about favourable changes in this field too, with a view partly to increasing milk production, partly to further developing meat production.

Since 1964 some progress has been made in the introduction and spread of large-scale livestock farming methods too. Some state farms as well as co-operative farms of considerable means developed highly up-to-date pig farming systems, established egg and chicken factories, and mechanized the most labour intensive operations in cattle breeding. The results are a considerable increase of production, stabilization – and sometimes a slight fall – in prices. However, owing to the long losing years of agricultural production, and in consequence of the original want of capital in Hungarian agriculture, the modern large-scale forms of livestock farming cannot for a long time be exclusively dominant in production, and in certain branches of livestock farming the small-scale, homeplot methods of management remain prevalent. While e.g. in poultry farming eggs and chicken factories are operated, laying hens and broiler ducks are produced on a farm scale, small-scale poultry raising remains also quite considerable. In the pig branch again, modern pig-fattening and processing develop parallel with the large and ever growing stock of homeplots. Yet, large-scale production is expected to become dominant within one or two decades. In the cattle branch, where housing for the animals can only be provided with substantial investments, the small-

scale and mainly homeplot method of management will be maintained for decades, and so the family labour and the old, not sufficiently modernizable livestock buildings will be utilized for a long time. Reorganization in the livestock sector takes thus much more time than in other branches of agriculture, especially in field crop growing.

The increased consumption of the population and the decreasing number of the agricultural population called the attention of the government to duties following from this peculiar position of livestock farming. With the constantly rising living standards a further increase in the meat, milk, egg, etc. consumption of the population must be reckoned with, which – considering that due to the foreign exchange situation of Hungary the supply of the population cannot be based on imports for decades, on the contrary, an increase of exports would be desirable – may create a tension on the internal market. Another point to be taken into consideration is the rapid decrease in the number of the older generation in the agricultural population, and that younger people do not maintain cattle or pigs in the homeplots any longer. In 1972 the government elaborated, therefore, a long-term – two decades – livestock breeding programme. In this a divided solution is outlined which ensures the gradual strengthening of modern large-scale production methods with a simultaneous increased exploitation of the given small-scale possibilities. The raising of purchase prices, reduction of the prices of modern starters, concentrates and fodder mixtures, establishment of large-scale livestock buildings by state subsidies are only a few examples of the way the government wish to promote the development of livestock production and ensure its profitability. Only if we think of this programme as affecting in its consequences the whole of the national economy (e.g. by increasing the building capacity, modifying the supporting system of consumer prices, etc.) can we fully assess its importance. This complex development programme – especially when later on some problems unsolved today of large-scale animal management and hygiene will be settled – will ensure a fast rate development of livestock breeding in the coming decades, and eliminate the obstacles having hindered it in the past decades.

Notes

(1) The statistical data are not comparable in every respect. Before the war the actual number of the livestock was certainly much higher than shown by the census, and the extent of withholding roughly the same. In 1945, and especially after 1949 (owing to severe penalties) the peasantry could no longer withhold the real number of animals, particularly not for cattle and horses. Thus, in 1950 the number of the livestock did not reach the *actual* number of 1938. This applies mainly to the cattle stock.

(2) In which the increased use of cows for draught work had also a part (in 1942 only 14·2, in 1947, 44·4 per cent).

(3) On the basis of data of the Hungarian Statistical Year-Books (Magyar Statisztikai Évkönyv).

(4) It must be noted that 70 per cent of the poultry stock was raised in small farms (homeplots and subsidiary farms) even in 1972.

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